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ABSTRACT

The Adult Multiple Intelligences (AMI) Study investigated how multiple intelligences (MI) theory can support instruction and assessment in adult literacy education across different adult learning contexts. Two interwoven qualitative research projects focused on applying MI theory in practice. One involved 10 teacher-conducted and AMI co-directors-facilitated studies; another was a study across those contexts. Methods included onsite observations, qualitative interviews, and teacher journals. Data analysis in the second study identified these two broad categories of teachers' interpretation: MI-inspired instruction and MI reflections. Findings suggested teachers' MI efforts paid off with high levels of student engagement. Among the MI-inspired instructional practices, projects resulted in the highest levels of authentic instruction, since they related directly to students' experiences. MI theory made topics not grounded in students' lives more meaningful and relevant because students could approach activities from their preferred and strongest intelligences. Choice-based activities were instrumental in increasing the relevance and meaning of lessons and in reducing teacher-directedness. The value of student reflection in building self-confidence and learning-to-learn skills was affirmed. Nine of the 10 teachers implemented some form of MI reflection. Appended are: AMI Study Advisory Council list; AMI Project Application; AMI Teacher Interview and Observation Guide; and Abstracts of the AMI Teachers' Research Reports. (Contains 51 references and 10 figures.) (YLB)

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Open to Interpretation: Multiple Intelligences Theory in Adult Literacy Education

Silja Kallenbach • Julie Viens

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NCSALL Reports No. 21

Open to Interpretation:
Multiple Intelligences Theory in Adult Literacy Education

Findings from the Adult Multiple Intelligences Study

Silja Kallenbach
World Education

Julie Viens
Harvard Project Zero

NCSALL Reports #21
May 2002

National Center for the Study of Adult Learning and Literacy

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EXECUTIVE SUMMARY

Purpose

The Adult Multiple Intelligences (AMI) Study was the first systematic effort related to multiple intelligences (MI) theory in adult literacy education. It was conceived in response to the lack of MI research, practices, and resources in adult literacy and in light of the positive experiences with MI theory at the pre-K–12 level.

MI theory is a definition and conceptualization of human intelligence. It is not and does not prescribe a particular approach or set of activities. Instead, MI theory offers a specific conceptualization of intelligence, elements of which have implications for classroom practices. Introduced by Dr. Howard Gardner, MI theory includes the concepts that intelligence is pluralistic, encompassing at least eight intelligences (linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, naturalist, interpersonal, and intrapersonal); intelligences operate in combination; and every individual has a unique profile of intelligences that is manifested as different areas of strength.

The overall purpose of the AMI Study was to improve adult literacy practice. It was prompted by four well-documented needs and conditions in the adult literacy field:

- A high incidence of learning difficulties among adult learners
- Low self-efficacy among adult literacy learners
- The need to improve learner retention rates
- Limited professional development opportunities for adult literacy educators

The AMI Study investigated the following question: How can MI theory support instruction and assessment in Adult Basic Education (ABE), Adult Secondary Education (ASE) and English for Speakers of Other Languages (ESOL)? It was designed to provide professional development for adult literacy educators and to recruit and support a small group of these educators as research partners. We wanted them to consider MI theory and develop MI-based practices for their own contexts, with our active support and guidance.

Methodology

Through the AMI Study, we examined the application of MI theory across different adult learning contexts and produced understanding and tools to support future MI-related research and practice in the field.

The study design incorporated two interwoven qualitative research projects focused on applying MI theory in practice. The first involved 10 studies, which teachers conducted and the AMI co-directors facilitated. The second was a study across those 10 contexts, conducted by the co-directors. This report focuses on the latter of the two studies.

Our naturalistic approach—involving research of real practices in real classrooms—invited analyses and comparison of specific applications of MI theory across different instructional contexts and with different teacher and learner populations. Our methods included on-site observations, qualitative interviews, and teacher journals.

Findings

In our analysis of the AMI data, we identified two broad categories of teachers' interpretation, which we termed MI-Inspired Instruction and MI Reflections. MI-Inspired Instruction focused on classroom practices and materials, whereas the MI Reflections focused on using MI to engage students in reflecting about their own strengths, weaknesses, interests, and preferences.

The AMI findings suggest that the teachers' MI efforts paid off with high levels of student engagement. Among the MI-inspired instructional practices, projects resulted in the highest levels of authentic instruction. Even if the projects were of limited scope, they related directly to students' experiences. MI theory also made topics that were not grounded in students' lives more meaningful and relevant because students could approach activities from their preferred and strongest intelligences. Choice-based activities, prominent in the AMI settings, were instrumental in increasing the relevance and meaning of lessons and in reducing teacher directedness. Choices allowed students to identify, use, and demonstrate their particular areas of strength. This made learners more confident about taking greater control of their own learning, and it pushed teachers to allow that to happen.

The AMI Study affirmed the value of student reflection in building self-confidence and learning-to-learn skills. However, our experience also strongly suggests that developing adult literacy learners' associated metacognitive skills—

their ability to think about and assess their learning processes and preferences—takes active work on the part of both teachers and students.

Nine of the 10 teachers implemented some form of MI Reflections, such as introducing the theory, uncovering and celebrating students' strengths, exploring careers, or identifying effective learning strategies with students. Six teachers ultimately positioned MI Reflections as a significant part of their teaching practice. The range of the teachers' experiences and the differences and similarities among them tell us two things about MI Reflections. First, it is important to connect explicitly for students the purposes of MI Reflection activities and broader learning goals. At the same time, our experience also suggests that no matter how carefully planned, relevant, and wonderful the activities, we often cannot predict what will work with a particular group of students.

Implications

Implications for Practice

The AMI Study illustrated how MI theory can be used well and substantively in adult literacy education. There is now a foundation of MI practice in adult literacy that can serve other practitioners in the field. However, individual teachers need certain knowledge and skills, including an understanding of the theory and access to and willingness to implement a diverse body of learning activities. To implement a curriculum that offers students at the beginning literacy levels multiple pathways to learning a particular skill, concept, or subject also requires the educator to develop the students' metacognitive skills. At the same time, teachers need to anticipate that not all students will necessarily embrace MI-inspired lessons or reflections. Teachers also need to be willing to get to know their students in a more holistic way, as adults who not only possess academic strengths and weaknesses, but also have talents, interests, and life experiences that teachers can consider when they plan lessons.

Over the course of the AMI Study, we learned that teachers need their literacy program's support to engage in and sustain MI-based practices. Programs can express institutional support by ensuring that teachers have adequate paid preparation time, access to staff development, permission to purchase a wide variety of supplies, and the ability to change the physical learning environment so it is conducive to different types of activities and groupings.

Implications for Policy

A policy and accountability system that speaks to what we learned would capture a broader range of goals and more multidimensional ways to gauge student progress than currently found in the federal government's National Reporting System criteria. For example, improvement in students' sense of self-efficacy or metacognitive skills could be considered legitimate secondary outcomes, joining such criteria as registering to vote, reading to one's children, and getting off welfare.

Implications for Research

More definitive research is needed to investigate learning gains and other impacts of MI-based practice. As an exploratory qualitative study, the AMI Study sets the stage for this further research. Studies that look at the impact of specific MI-based interventions would be a logical outgrowth of the AMI Study. How MI-inspired practices improve students' self-efficacy is another area that merits more investigation. Another potentially fruitful area of study is teacher change. In addition, it would be instructive to do a follow-up study with the same teachers to ascertain the extent to which they made lasting changes in their teaching practice as a result of their participation in the AMI Study.

CHAPTER 1: INTRODUCTION

The AMI Study

In 1993, learning differences and disabilities emerged as the leading staff development interest among New England adult literacy educators, according to a needs assessment the New England Literacy Resource Center (NELRC) conducted. The Adult Multiple Intelligences (AMI) Study grew out of NELRC's subsequent efforts to address this need.

In 1995, NELRC director Silja Kallenbach convened a working group of adult literacy educators and professional development providers from the New England states to discuss and explore how multiple intelligences (MI) theory could be applied in adult literacy education. The group agreed that MI theory had the potential to improve teaching and learning in adult literacy education through the window of learning differences that the theory represented.

The group also discovered that applying MI theory in adult literacy education was uncharted territory. The published literature on MI theory was almost exclusively for pre-K–8 educators (Campbell & Campbell, 1999; Chen et al., 1998; Kornhaber & Fierros, 2000; Kornhaber & Krechevsky, 1995; Viens & Kallenbach, in press). A literature search did not produce a single study or teaching guide for applying MI theory in adult literacy. Three years later, a more thorough literature search yielded the same results.

The AMI Study was conceived in response to the lack of MI research, practices, and resources in adult literacy and in light of the positive experiences with MI theory at the pre-K–12 level. The AMI Study was the first systematic effort related to MI theory in adult literacy education.

Kallenbach approached Project Zero, co-directed by Dr. Howard Gardner at the Harvard Graduate School of Education, about collaborating on a joint study of how MI theory could support and enhance adult literacy education. Gardner introduced MI theory in 1983 and had directed MI-based research studies since that time. However, until 1996, Project Zero had not done any work in adult literacy education. Julie Viens, a researcher at Project Zero, took an interest in the idea and joined Kallenbach in conceptualizing the AMI Study. As a long-time researcher and professional development provider, Viens was intrigued by MI-centered staff development and the opportunity to bring MI theory to adult literacy education. The AMI Study was developed as a collaboration between Harvard's Project Zero and the NELRC at World Education, under the auspices of the National Center for the

Study of Adult Learning and Literacy (NCSALL) at the Harvard Graduate School of Education.

The overall purpose of the AMI Study was to improve adult literacy practice. The study was designed to provide professional development for adult literacy educators and to recruit and support a small group of these educators as research partners. Rather then propose that teachers simply adapt existing (K–12) MI-based interventions, we wanted adult literacy educators to consider MI theory and develop MI-based practices[1] for their own contexts, according to their best professional judgment and with our active support and guidance. We (Kallenbach and Viens) felt strongly that adult literacy teachers' participation as researchers was indispensable to the study, which led to a relatively complex project design. Our 10 teacher research partners would conduct independent studies of their choosing about an aspect of applying MI theory. Therefore, we would facilitate professional learning opportunities for the AMI teachers on the subject of MI theory and teacher research, support their research efforts, and conduct a cross-site study of their efforts.

The bulk of this research report focuses on the AMI cross-site study. Details regarding the individual teacher research projects can be found in a bound collection of their research reports (Kallenbach & Viens, 2000). We begin this report by examining the AMI Study's theoretical and historical backdrop, MI theory, and adult literacy education, following this with our rationale for embarking on the study. In the Research Methods section, we introduce teacher research and give an overview of the AMI teacher research studies. We describe our data collection and data analysis activities and consider validity issues related to the cross-site study. Findings focus on how the AMI teachers interpreted—that is, understood and applied—MI theory. We present the key factors that impinged on how the AMI teachers used MI theory in their contexts. We conclude this research report with the implications of the AMI Study for practice, policy, and research.

[1] We use the following terms interchangeably throughout this report: MI-based, MI-inspired, MI-informed, and in the spirit of MI theory.

A Theoretical and Historical Introduction to MI Theory

The introduction of MI theory in 1983 generated considerable interest in the educational community (Gardner, 1993). This new theory was provocative, claiming at least seven relatively independent intelligences (Figure 1). This was a marked contrast to the traditional view of a unitary, "general" intelligence. Twelve years later, Gardner put forward an eighth intelligence: naturalist. MI theory suggests a radically different way of defining intelligence: as "the biological potential to process information in certain ways that can be activated in a cultural setting to solve problems or make products that are valued in a culture" (Gardner, 1993 & 2000).

Figure 1: The Eight Intelligences

Linguistic
Logical-mathematical
Spatial
Musical
Bodily-kinesthetic
Naturalist
Interpersonal
Intrapersonal

MI theory was a stark contrast to the common understanding of intelligence, which was defined by the Intelligent Quotient (IQ) early in the 20th century. At the request of the French Ministry of Education in the early 1900s, Alfred Binet and his colleague Theodore Simon had developed a test that identified children at risk for school failure. The test was effective for that purpose, but it was soon used as the basis for the psychometric measurement of individuals' general capabilities or intelligence. Since that time, intelligence tests have been heavily weighted toward the types of highly predictive abilities Binet measured in his test, including verbal memory; verbal reasoning, numerical reasoning, and appreciation of logical sequences.

In 1912, German psychologist Wilhelm Stern came up with the Intelligence Quotient, or "IQ," which represents the ratio of one's mental age to one's chronological age, as measured by intelligence tests. In the early 1920s, Lewis Terman, an American psychometrician, introduced the Stanford-Binet IQ tests, the first paper-and-pencil, group-administered versions of the test. Largely because of Terman's work, the intelligence test quickly became a standard part of the U.S. educational

landscape. Since that time, most people have equated intelligence with this psychometric view. Terman's work also had a significant role in the development of two additional beliefs about intelligence: It is inherited and largely unchangeable. Thus, current wisdom about intelligence gives it three immutable characteristics: Intelligence is testable, genetic, and unitary (Gardner, 1993; Gould, 1981).

Although current wisdom still equates intelligence with IQ test scores, actual IQ testing nowadays is primarily limited to special situations, such as when a learning disability is suspected or when selecting entrants into a gifted program (Gardner, 1999). The line of thinking to which intelligence testing gave rise maintains a powerful presence. Most academic measures—the SATs and the like—are, in fact, thinly disguised intelligence tests (Gardner, 1993). The traditional view of intelligence has been long internalized in U.S. schools, and it is the foundation on which much of our instruction, curriculum, and assessment practices and policies rest. In adult education, the tests of General Educational Development (GED) and test of English as a foreign language (TOEFL) are examples of such assessment practices.

Long-held societal views of intelligence have direct implications for our teaching and learning practices. The traditional view of intelligence has played a significant role in determining standard school fare, perhaps best described as seatwork, with its emphasis on the same narrow set of language and math skills that hearken back to intelligence test items. Core curricula and our most common tools for assessing disability and giftedness are grounded in this limited view of intelligence (Baum, Viens, & Slatin, in press).

Gardner (1993) initially had little to say about MI theory's classroom application. He intended and expected MI theory to find an audience in the field of psychology, where intelligence is a realm of study. Yet educators were and continue to be most drawn to the idea of multiple intelligences.

The impact of IQ on teaching and learning practices suggests potentially far-reaching implications of MI theory for education, and for educators and students of all stripes. In stark contrast to the traditional view of intelligences, MI theory suggests a need for active, authentic, problem-based instructional approaches and performance-based, real-world assessments (Gardner, 1993 & 1999; Kornhaber & Krechevsky, 1995).

Since approximately 1988, MI theory has inspired hundreds of MI-informed programs, schools, and classrooms. These research and practice efforts have been undertaken primarily at the elementary school level (Baum et al., in press; Campbell

& Campbell, 1999; Chen et al., 1998; Kornhaber & Fierros, 2000; Kornhaber & Krechevsky, 1995). The existing research suggests that MI-based initiatives can have a range of positive effects on students, parents, teachers, and schools, including more self-directed, confident students (Chen et al., 1998); fewer disciplinary problems; higher achievement; more parent involvement (Campbell & Campbell, 1999; Fierros & Kornhaber, 2000); and positive affective changes and organizational restructuring (Kornhaber & Krechevsky, 1995).

MI theory is a formal theory based on empirical research (Gardner, 1993 & 2000). It validates what many teachers already know and do when they use diverse classroom practices. MI theory complements or organizes teachers' pre-existing approaches, such as whole language or cooperative learning. Teachers note that MI theory supplies a framework to support teaching and a language for collaboration and discussion with colleagues (Kornhaber & Krechevsky, 1995). Scores of teachers and programs across the United States and abroad have used MI theory as the basis for improving their practices.[2] It continues to be the organizing framework for dozens of school-change efforts (Baum, Viens, & Slatin, in press; Campbell & Campbell, 1999; Gardner, 2000).

The Adult Literacy Context and the AMI Study

Although we did not set out to measure how particular applications of MI theory could solve specific problems, the AMI Study was prompted by four well-documented needs and conditions in the adult literacy field that still exist today:

1. A high incidence of learning difficulties among adult learners
2. Low self-efficacy among adult literacy learners
3. The need to improve learner retention rates
4. Limited professional learning opportunities for adult literacy educators

Many adult literacy learners have difficulties learning academic content and skills through the field's prevailing methods of instruction, which include completing workbook exercises, responding to comprehension questions about a reading or presentation, and writing in responses to prompts. For some, these difficulties were what had driven them out of the K–12 system as youngsters. The Academy for Educational Development states:

[2] See Gardner, 2000, for a comprehensive list of MI practitioners and settings.

> Varying estimates of the number of American adults with learning disabilities range from 3 to 15 percent of the general population. An even greater incidence of learning disabilities is likely to be just what that proportion is; the estimates range from 30 to 80 percent. (1999)

Through research, experience, and the comments of numerous teachers, we knew that many adult literacy learners have little confidence in their ability to learn and do not feel competent or intelligent in academic settings. Whether or not they have a diagnosed learning disability, many have a low sense of self-efficacy when it comes to mastering reading, writing, or math. Adult literacy learners often describe pervasive feelings of shame, embarrassment, and self-consciousness related to literacy (Fingeret & Drennon, 1997). At the same time, they often look upon themselves as competent workers, parents, citizens, and friends. This dissonance creates an internal tension for many adults who have limited literacy skills. This tension often is unwittingly exacerbated by educators and by the general public, who remain bound to a skills- or task-based conception of literacy.

Improving student retention rates continues to be a long-standing issue in the adult literacy field. The National Evaluation of Adult Education programs found that 50 percent of adults who enroll in adult basic education (ABE) classes drop out before completing 35 hours (Young, Fleischman, Fitzgerald, & Morgan, 1994). More recent research by Comings and his colleagues (1999) suggests that improved self-efficacy is one crucial support for retention, which they describe as learner persistence.

Another indisputable need in adult literacy that shapes the AMI Study design is the lack of adequate professional development opportunities and supports for adult literacy educators. Smith et al. (2001) found that "although the majority of the teachers in our study had taught in the K–12 system, 57 percent had not taken a single undergraduate course related to teaching adults" (p. 4). Forty observations of 20 classes demonstrated that teaching in ABE is by and large teacher directed and that teachers presumably teach the way they were taught (Beder, 2001). When we consider this in conjunction with Smith et al.'s finding, we can reasonably assume that teacher directedness results at least partially from a lack of training and professional development. Therefore, we wanted to make our study a vehicle for professional development on MI theory and teacher research.

The AMI Study was implemented in a field in which most educators' working conditions are limited in many respects:

> It is hard to imagine how the field of adult learning and literacy will be able to provide the type of instructional services learners need when teachers—most of whom are part-time and do not receive benefits or salaries commensurate with their K–12 counterparts—are faced with working conditions and environmental factors that make it difficult for them to learn about and deliver quality instruction. (Smith, Hofer, & Gillespie, 2001)

A recent Jobs for the Future (2001) study of ABE in five New England states corroborated Smith et al.'s conclusion that resources are so limited, facilities are so inadequate, and teacher training is so poor that the "task [of improving adult literacy instruction and the overall system] is alarming" (p. 1). Although the AMI Study did not offer a solution to the widespread systemic problems that encumber the adult literacy field, it provided an intensive professional development opportunity for the participating teachers details of which are discussed in the following pages (see Teacher Research Activities, p. 15).

CHAPTER 2: RESEARCH METHODS

As the co-directors of the AMI Study, we began by asking the following question: How can MI theory support instruction and assessment in ABE, adult secondary education (ASE), and English for Speakers of Other Languages (ESOL)? This question framed the AMI research activities and anchored the AMI teachers' research studies and MI practices. By framing the project with this question, we could study the application of MI theory across different adult learning contexts and produce the understanding and tools to support future MI-related research and practice in the field.

The AMI Study design incorporated two interwoven, naturalistic, qualitative research projects focused on applying MI theory in practice. The first involved 10 studies that teachers conducted and the AMI co-directors facilitated. The second was a study across those 10 contexts, conducted by the co-directors. In this section, we discuss the teacher research studies and report on methods of data collection and analysis we employed in the cross-site study. Discussion of the cross-site study findings begins on page 29. The abstracts of the individual teachers research projects are in Appendix 4.

Our naturalistic approach—involving research of real practices in real classrooms—invited analyses and comparison of specific applications of MI theory across different instructional contexts and with different teacher and learner populations. It guided us to employ methods that generate rich descriptive data about teaching and learning and about the complex nature of classroom realities. Our methods included on-site observations, qualitative interviews, and teacher journals. The cross-site study was grounded in real adult literacy contexts to inform real adult literacy contexts.

In summary, the AMI Study has two components: 1) Teacher research studies conducted by individual teachers for their own professional growth and improved practice (and that generated data for the second component) and 2) A cross-site study to gain more broadly applicable insights regarding MI theory in adult literacy education. The overall purpose of the AMI Study is to inform adult literacy practice so it is better aligned with adult learners' strengths and learning differences.

Teacher Research Studies

We chose to use a teacher research model, which involved supporting several independent investigations by teachers, because of its capacity to address our research and professional learning goals, including:

- Grounding our understanding of MI theory and practice in real adult literacy practice
- Supporting teachers' learning about MI theory and practice
- Making our findings relevant and informative to other adult literacy educators and policymakers
- Developing and collecting many examples of MI practices in adult literacy classrooms
- Creating a useful resource for teachers about MI in adult literacy teaching and learning
- Presenting illustrative stories from divergent points of view to help deepen the audience's understanding of our findings

These goals required a research approach that was conducted in existing adult literacy contexts, included the teachers' perspectives and voices in substantive ways, and resulted in "thick" descriptions (Geertz, 1983).

Teacher research is systematic, intentional inquiry by teachers and counselors about instruction, counseling, and/or assessment (Lytle & Cochran-Smith, 1993). Teacher research is constructivist; practitioners learn by making information personally relevant, developing and trying new approaches, reflecting on the process and results, and questioning their own assumptions. It has emerged as a powerful way to engage teachers in investigating and ultimately improving their own practice. The teacher researcher is an insider to the setting, someone who knows the place and the players, is involved in the situation, and cares about the work (Lytle & Cochran-Smith, 1993).

Teacher research helped ground our research within real classroom practice by providing a structured yet open-ended way for the AMI teachers to ask their own questions about MI theory in their own teaching contexts. Its constructivist bent allowed teachers to articulate their own questions, conduct their own studies, and draw their own conclusions. From a constructivist perspective, it was important for participating teacher researchers to take a fresh look at MI theory through the lens of an adult educator.

The teacher research approach seemed particularly appropriate for the study of MI theory in practice because there is no one right way to apply it in any context. The fact that MI theory is a theory of intelligence, not of education, leaves room for interpretation and debate. Through its teacher research approach, the AMI Study made room for that interpretation and debate, and for variation in how the teachers ultimately used MI theory. Using a teacher research approach's tools and structure, each AMI teacher sought to discover what MI theory might offer teaching and learning in her own setting, while contributing to the overall examination of its implications for teaching and learning in the field.

MI theory set the parameters for the teachers' research questions and provided a unifying theme for their research, and the teacher research approach provided a vehicle for AMI teachers' collaboration and mutual support. By offering a context for the teachers to learn together and from one another, the teacher research approach also served the AMI Study's teacher development goals.

The teacher research approach also supported the development of a collection of practical applications of MI theory specifically designed for adult literacy education. The AMI research approach assumed that the teacher researchers would create original, MI-inspired approaches and experiences in the pursuit of their research questions. For the AMI teachers, the research context and implementation of MI theory were one and the same. They developed MI practices—projects, units, and activities—through which to ask their research questions and pursue their professional learning goals around MI theory.

The AMI teachers were motivated to document their practical applications of MI theory because they wanted the AMI Study to generate resources they would have liked when they had first considered MI theory. They were painfully aware of the dearth of resources specifically geared to adult literacy educators on nearly any topic, including MI theory and practice. The teachers understood the limitations of simply transferring pre-existing (K–12) practices to adult literacy education. Developed in real settings by real teachers, MI applications resulting from teacher research are the most useful, practical, and well received by adult literacy educators.

Participant Selection

We involved 10 teacher researchers: 2 ESOL; 1 ABE; 1 career counselor; and 6 adult secondary level teachers (GED and adult high school diploma), one of whom also taught at the ABE level. These teachers were spread across five New England states: Connecticut, Maine, Massachusetts, Rhode Island, and Vermont. A 10-member advisory council (Appendix 1) and the AMI Study co-directors selected them from

among 30 applicants. The teacher researchers were chosen according to several criteria, including their interest in exploring MI theory, willingness to take a reflective stance towards their work, and thoughtfulness about their teaching practice; ability to write clearly; documented institutional support; and letters of recommendation (see Appendix 2 for the application questions).

We also wanted to maintain a balance of program types (ABE, ESOL, GED, or diploma), program contexts (small or large classes, range of weekly contact time with students, home-based versus center-based), and settings (rural, small town, urban) to reflect as much as possible the real range of program types, contexts, and settings in adult literacy education. For example, in Vermont, three hours of instruction per week is typical, whereas in Massachusetts, it is double that or more. Also, in Maine and Vermont instruction in students' homes is quite common, largely because transportation is lacking in rural areas; it is virtually nonexistent in Connecticut, Massachusetts, or Rhode Island.

The AMI teacher researchers taught in rural, small town, and urban settings. Their teaching contexts reflected the diversity of the adult literacy field (see Figure 2). For example, one teacher's classes were conducted in the students' homes in rural Maine. The other ESOL, ABE, and GED classes took place in community-based and public school–based learning centers and a community college. The AMI Study was incorporated into the regular schedule and practices of each participating program. Weekly hours of instruction varied from 90 minutes to 20 hours.

Figure 2: AMI Teacher Researchers and Their Settings

Teacher[3]	State and setting	Type of instruction	Format of instruction	Hours of instruction per week	Total number of students
Betsy Cornwell	Maine: rural, small town	ABE Diploma Citizenship ESOL	One-on-one/two in students' homes	1 1/2 hours	8
Meg Costanzo	Vermont: rural, small town	GED Diploma	Class	4 hours	17
Terri Coustan	Rhode Island: urban	ESOL literacy	Class	8 hours	19
Bonnie Fortini	Maine: rural, small town	Math	Class, lab	3 hours	33
Martha Jean[4]	Massachusetts: midsize town	GED	Class	6 hours	5
Jean Mantzaris[5]	Connecticut: small town	Career planning	Class	10 hours	7
Diane Marlowe	Connecticut: urban	ABE GED	Class	17 ½ hours	17
Wendy Quinones	Massachusetts: small town	Transition to work or college	Class	20 hours	26
Diane Paxton	Massachusetts: urban	ESOL	Class	4 hours 6 hours	25
Lezlie Rocka	Rhode Island: urban	Basic reading & writing	Class	8 1/2 hours	15

[3] AMI teachers' real names are used, with their permission.

[4] The number of students represents the students in Martha's class who had considerable learning difficulties and on whom Martha focused her research.

[5] Jean Mantzaris came on board in October 1997 to replace Diane Marlowe, who left the study in June 1997.

The Teachers' Research Questions

From January 1997 through March 1998, the AMI teachers conducted inquiries in their own settings, framed by a research question of their choice that related to their practice and to MI theory.[6] The study co-directors advised the teachers, but the final form of the research questions remained in teachers' hands.

Six of the AMI teachers modified their research questions during the first six months of the study to arrive at the right grain size for their question and study. For example, teachers starting out with multiple questions or multiple strands in one question narrowed these to one, or they gave the second question less emphasis. One teacher (Meg Costanzo) changed the original focus of her inquiry; she moved from a focus on project-based learning and MI theory to a broader focus on how MI theory can be applied in her setting. The teachers' research questions were all drawn from the overall research question: How can MI theory support instruction and assessment in ABE, ASE, and ESOL? Their research questions are listed in Figure 3.

[6] Each teacher authored a comprehensive report of her AMI teacher research study. All nine reports are bound in the volume *MI in Practice: AMI Teacher Research Reports.* (2001). Cambridge, MA: National Center for the Study of Adult Learning and Literacy.

Figure 3: AMI Teachers' Research Questions

Teacher	Research question
Betsy Cornwell	Will awareness of their own intelligence profiles help my students become more independent learners?
Meg Costanzo	How can teacher and student, working collaboratively, (a) identify the student's strongest intelligences through MI-based assessment and classroom activities and (b) use the understanding of these intelligences to guide the learning process?
Terri Coustan	What impact do ESOL activities informed by MI theory have on student engagement and learning strategies? How do prior cultural learning and experiences shape students' reaction to and participation in ESOL activities informed by MI theory?
Bonnie Fortini	What kind of MI-based instruction and assessment can be developed that will help adult learners deal with math anxiety so they may reach their stated goals?
Martha Jean	Can MI-informed lessons help the progress and attendance of LD and ADD students preparing for the GED?
Jean Mantzaris	How will adult diploma students' awareness of their own intelligences and their participation in activities informed by MI theory affect their career decision-making process?
Diane Marlowe	What happens when I use MI theory in teaching math?
Diane Paxton	What effect does metacognitive awareness of their own multiple intelligences have on the perceptions of effective ESOL teaching and learning by students with limited native language literacy? What happens when I try to integrate MI into an ESOL class?
Wendy Quinones	Will the use of multiple intelligences framework support the goals and practices of popular education in an ABE classroom?
Lezlie Rocka	How does knowledge of MI theory broaden a multisensory approach to the teaching of writing and reading?

Teacher Research Activities

The AMI teachers were paid an annual stipend of $5,000, working under contract with NELRC/World Education with specific requirements related to conducting and completing their research studies and otherwise participating in the AMI Study from December 1996 through June 1998. The tasks required of the teacher researchers and the rationale for each are described here.

AMI Teacher Researcher Tasks and Rationales

- Read at least two of the three resource books (see Figure 5) and two articles on multiple intelligences, to provide a grounding in MI theory.
- Formulate a research question and develop a written research plan (including data collection methods and a timeline), with support from and in consultation with the project co-directors, to ensure each teacher's research plan contributes to the overall research question and to the individual teacher's professional learning.
- Implement and document a research project according to the agreed upon research plan so that the individual studies proceed as part of a coordinated plan.
- Use at least two additional data collection methods aside from keeping a monthly journal, such as administering class surveys, conducting interviews, and observing students, to have multiple sources of evidence to substantiate findings (for example, see Figure 4, Student Feedback Form).
- Submit at least three pages of a teacher log of reflections, questions, and accounts of activities[7] to ensure ongoing, documented reflection (see Figure 6, AMI Monthly Teacher Journal Guidelines).
- Collaborate in planning and implementing three or more on-site visits, observations, and videotaping by project staff, so that the project co-directors can collect data for the cross-site study.
- Give input into planning and participate in 7 two-day, quarterly AMI institutes in Boston, with travel and lodging expenses paid by the project, so the teachers can engage in professional development that deepens their understanding of MI theory, teacher research in general, and their particular study.
- Participate in online discussions. Post/upload one or more selections or excerpts from a teacher log at least once a month onto the AMI listserv, to maintain communication and build community among the researchers between the quarterly institutes.
- Submit documentation of the first phase of the research project, as outlined in the agreed upon teacher research plan, to begin preliminary data analysis and adjust the research plan.
- In collaboration with the project co-directors, write a brief (2-3 page) article on the research project for publication in the *Focus On Basics* journal, to begin to disseminate information about the AMI Study.
- Work with one or two other AMI teacher researchers to develop a unit for the AMI Sourcebook, to enable the project to create a practical resource for adult literacy educators that includes the best lessons developed by the AMI teachers.

[7] AMI teachers submitted their journals with the understanding that it was acceptable to edit out sections they considered personal or private.

- Conclude the study, analyze the data, and articulate the findings in a final written research report, including one or more preliminary drafts, to deepen understanding of MI theory and practice in adult literacy education.

Figure 4: Student Feedback Form

1. What worked for you? (MI activities)
2. What didn't work? (MI activities)
3. Do you want more review on this subject or specific area?
4. Would you like to focus on other areas of subjects?
5. Any other comments?

We recognized that the AMI teachers would need ongoing professional development and support from us (the co-directors), outside consultants, and each other to carry out the study requirements. We and, to some degree, the AMI advisors actively guided the teachers' implementation of both the research and practice elements of their projects. The teachers received articles and books on MI theory and teacher research (see Figure 5) as common reference points and as part of their professional learning in preparation for conducting their teacher research studies and applying MI theory.

Figure 5: AMI Common Teacher Resources

1. Armstrong, T. (1993). *Seven kinds of smart: Identifying and developing your many intelligences*. New York: Plume/Penguin Books.
2. Caine, G., & Caine, R.N. (1994). *Making connections: Teaching and the human brain*. Menlo Park, CA: Addison-Wesley Publishing Company.
3. Campbell, B. (1994). *The multiple intelligences handbook*. Stanwood, WA: Campbell & Associates, Inc.
4. Teaching for multiple intelligences. (1997, September). *Educational Leadership, 55*(1).
5. Gardner, H. (1993). *Frames of Mind* [10th anniversary edition]. New York: Basic Books.
6. Gardner, H. (1993). *Multiple intelligences: The theory in practice*. New York: Basic Books.
7. Hubbard, R., & Miller Power, B. (1993). *The art of classroom inquiry*. Portsmouth, NH: Heinemann.

AMI Institutes

Between December 1996 and June 1998, the AMI co-directors organized seven AMI institutes. At these events, the teacher researchers learned about and discussed teacher research and MI theory and shared their successes and struggles. Several institutes included descriptive review sessions, a structured feedback protocol based on the "descriptive review process" introduced by Pat Carini (1979). In a descriptive review, each participant states one thing that stands out for her about the object of the feedback. The individual receiving feedback listens but does not respond or engage in a dialogue until all the feedback has been given. Another round typically consists of people stating a question about the document being reviewed. As with Carini's descriptive review, emphasis is placed on providing descriptive rather than evaluative comments that would prove useful to the person receiving the feedback. We used the descriptive review process at different points in the study to help the teachers refine data collection instruments, analyze data, and improve their report writing.

The AMI Study's success depended heavily on collegial, collaborative relationships between the research partners, who did not know each other before participating in the study. The institutes provided opportunities to establish communication and build community among the AMI Study partners. A closed listserv available to the AMI teachers and staff facilitated our communication in the periods between the institutes. To foster further communication and sharing among the teacher researchers, the co-directors divided the group into two subgroups whose members met by phone three times to discuss the progress of their studies and to give each other feedback. In addition, the teachers were asked to pair up as "buddies" for mutual support. The buddies communicated by phone and e-mail. They had a chance to know each other's research projects in greater detail and could therefore provide each other with more substantive support.

Teacher Research Findings

Despite their physical distance, the AMI teachers worked relatively closely as a research and learning community. They did not conduct their MI work in isolation from each other. In several cases, the AMI teachers influenced each other's work. For example, three AMI teachers (Fortini, Mantzaris, and Quinones) used the AMI Self-Survey Meg Costanzo had developed (Kallenbach & Viens, in press). Martha Jean's Choose 3 lesson format was borrowed and adapted by five of her AMI colleagues (Costanzo, Coustan, Mantzaris, Quinones, and Rocka).

The AMI teachers' research projects resulted in new understanding for each of the teachers regarding the use of MI theory in their settings. The projects also provided several sources of data for the cross-site study, the focus on the remainder of this report. Please refer to Appendix 4 for the abstracts of the individual teachers research projects. The individual teacher research studies and their findings are described in detail in *Multiple Intelligences in Practice: Teacher Research Reports from the AMI Study* (Kallenbach & Viens, Eds., 2001). MI-informed applications developed through the teacher research projects and topical essays are available in a forthcoming publication, *MI Grows Up:, Multiple Intelligences in Adult Literacy Education* (Kallenbach & Viens, in press). As the individual teachers' research studies and the numerous MI applications they developed are beyond the scope of this report, we suggest going to these resources for further information.

The AMI Cross-Site Study

Data Collection

The purpose of the cross-site study was to understand how MI theory could be used to good effect in adult literacy education. We sought to address this question by analyzing the combined experiences of the AMI teachers, how they interpreted and applied MI theory, and factors that influenced their decisions. We, the co-directors, served as the principal researchers. The cross-site study tapped into data from the teachers' research studies and included additional data collection methods, described below. Data collection activities generated an extensive body of data related to our major areas of analysis in the cross-site study: the AMI teachers' interpretation of MI theory, application of MI theory in their instructional practices, and use of MI theory in assessment practices. Data sources for the cross-site study included:

- **Teacher journals** submitted monthly from January 1997–March 1998. Each teacher researcher submitted at least three pages each month from her journal. Teachers could use suggested guidelines (see Figure 6) to structure their journal submissions, or they could use a format of their choice that included the information generated by the guidelines.
- **Classroom observations** conducted by the principal researchers 2–3 times per teacher and documented in writing and on audio or videotape.[8]
- **Semi-structured interviews, 2–3 times with each teacher researcher,** using a common set of questions (see Appendix 3).

[8] Only one observation was obtained for Diane Marlowe, who left the project in June 1997 because her program closed down, and two observations were obtained for her replacement, Jean Mantzaris.

- **Informal, tape-recorded conversations with some of the participating students**. Roughly 50 percent were interviewed.
- **Notes** from the seven AMI institutes, taken by AMI interns and assistants in the seven AMI institutes.
- **Two progress reports and a final report** written by each of the teacher researchers and containing their preliminary and final data analysis and synthesis of their individual research projects.
- **Notes** from three phone conference calls with subgroups of teacher researchers, taken by the co-directors.
- **E-mail communications**, including AMI listserv postings and individual messages, from December 1996 through February 2001. Approximately 10 percent of all AMI e-mail communications were relevant to research themes and not redundant with existing data, and were coded as data.
- **Artifacts**: Written examples of student work, as well as videotapes and photographs, were collected.

Figure 6: AMI Monthly Teacher Journal Guidelines

Goals and Plans for Lesson Students Present Description of the Lesson Teachers' Reflections on the Lesson Implications on Teacher Research and Next Steps

Data Analysis

Data analysis involved an iterative process of coding, categorizing, and sorting the data in a search for patterns (Miles & Huberman, 1994). We established our initial categories based on our coding of data collected in the first six months of the study (see Figure 7). Subsequently, and on an ongoing basis, we identified coding categories, their properties or indicators, and underlying analytic questions related to each (Strauss & Corbin, 1990). Figure 7 lists the coding categories, the indicators of data that fit the category, and examples from the actual data. The analytic questions that guided our data analysis are listed for each coding category. The electronic data were transferred into a qualitative analysis computer program (NUD*IST[9]). Among several of its strengths, NUD*IST allows each unit of data to be easily coded into more than one category, which proved very helpful to our analysis.

[9] Non-Numerical Unstructured Data Indexing Searching and Theorizing.

Figure 7: The AMI Analytic Process

Category	Indicators	Examples from data
TEACHERS' PERCEPTIONS OF STUDENTS How do the teachers characterize, describe, and represent adult learners?	Teachers' judgments about students' behaviors or qualities or talents or experiences NOT merely description about ordinary classroom proceedings and related behavior NOT teachers' perceptions of students' perceptions	The students really enjoyed the challenge of solving problems with multiple solutions. At the end of the evening, GN told me that he had really enjoyed class this evening. He described the session as intense. (MG/JO, 5/97) The lower-level students did not attribute any change to speak of to the MI experience. (BF/RP1) One of my students crochets beautifully. She must do it every night. . . . But in her case, she may have more bodily-kinesthetic and logical and linguistic intelligences associated with her skill than spatial because she always works with patterns. (DP/RP1)
TEACHERS' VIEWS ON AND UNDERSTANDING OF MI THEORY How do the teachers describe, talk about, understand, and critique MI theory?	Early stages based on patterns from K–12 research: • Assuming that teaching about the intelligences without changing instruction will have an impact on ways students learn • Viewing MI as a curriculum • Thinking that you have to teach everything 7–8 ways. • Not relating MI choices to the purposes of instruction	As I look back, I see that talking about MI is not as important as just doing MI, especially with this group of students. (DP/RP1) When I started this project, I labeled a student's thinking about himself or his learning as meta-cognitive. I looked upon MI theory as seven kinds of smart. I am beginning to think of MI as including metacognitive reflection as a part of it. . . . I am questioning where one ends and the other begins. (TC/JO, 4/97) I am debating the degree that culture plays on intelligence. I know to really understand MI you need a widespread and varied sample inside and outside of school. We might also need a checklist of behaviors that are more culture-free. (TC/JO, 4/97)

Figure 7 continued

Category	Indicators	Examples from data
TEACHERS' PERCEPTIONS OF STUDENT REACTIONS How do the teachers report students' reactions to and understanding of MI theory and MI-based instruction, and its value and relevance to their learning and lives?	Students' comments about themselves as learners and what they have learned that can be related to awareness of MI: • Students' comments about MI-based lessons • Students' comments about their future plans that reflect a better understanding of own strengths	Several students mentioned the activity they had done to cut out pictures out of magazines and make fractions with them . . . "because you could actually see it." Other students mentioned the M& M activity for similar reasons . . . "because you could see and feel and eat it!" One woman commented how she has been a cook for 15 years and had never learned fractions, even though she was using them in her daily work. Until this math class, she did not see the connection. Another student talked about how she used to hide her math book in a wood box so that she would not have to do her math homework. She was always anxious in math class. Yet she sews and now sees how math figures into sewing . . . about everyone had something positive to say about the class and their reduced math anxiety. (BF/SV, 4/97)
STUDENT COMMENTS How do students talk about MI and its value and relevance to their learning and lives?	Direct quotes from students	I learn best by visual rather than being taught by verbal teaching. (MC/JO, 3/97) 'Cause if they was a smart learner, they would not be asking for help. You'd already know all the answers. If they were smart they would not need school, and they would not need teachers. (BC/JO, 3/97)
ASSESSMENT How, to what end, and when do the teachers assess their students' intelligences, understanding, and academic progress that can be directly or indirectly linked to MI?	Assessment methods, tools, and results Decisions about when and what to assess NOT informal observations about students (code those yellow)	However, at the end of the game, they came up with a whole list of things in response to Elsa's question, "How and why did this game help you to learn?" (DP/RP1) I have developed a quick AMI assessment tool that I hope will serve two purposes. (MC/JO, 3/97)

Figure 7 continued

Category	Indicators	Examples from data
MI AS CONTENT To what end, how, and at what juncture do the teachers talk about MI to/with students?	Teachers' reflections on whether to introduce MI inductively/deductively Lessons where MI is explicitly discussed Teachers' reflections on what happened and students' reactions	I finally broke the intelligences ice with them. I made folders of 2–5 people doing things in each of the intelligence categories. . . They got some pretty good vocabulary and sentences about them and in fact seemed more interested in these photos than they usually do in talking about the photos I bring! (DP/JO, 2/97) I began using Gardner's words for the intelligences . . . I switched to terms like *Word Smart* and *People Smart*. (BC/RP1)
MI-BASED LESSONS What is the status of MI in instruction? How do the teachers integrate MI into curriculum and instruction?	Descriptions of lessons that can be considered MI-based; what is taught; how it is taught Teachers' reflections on how the lesson went Teaching beyond own intelligences Code lessons of teachers who recognize MI in own instruction regardless of whether they are new to MI oriented lessons or not	Last week, one of the students brought in a newspaper about heroin addiction. . . . This led to a discussion about drug abuse. The students appeared very interested in this topic. . . . I asked students to tell me everything that came to mind when they heard the term drug abuse. We listed all their responses on the board. . . . I presented the class with a list of seven possible activities on drug abuse. (MC/JO/0697)
PROJECT IMPLEMENTATION How do teachers talk about and carry out teacher research? What features of their teach context do teachers discuss in relation to the AMI project?	Description, opinions, and reflections about the teacher research process Information about contexts and constraints/barriers and helpful elements	I think that my methods and tools did shed light on my question by giving me different angles from which to view the same aspects of my class. (DP/RP1) Through teacher research, I have come to recognize my students on a much deeper level than I have ever previously known them. What I do as a result of that newly gained knowledge is influenced by my understanding of MI theory. (MC/RP1) I feel more invigorated than confused, quite sure that we re on a useful track. (BF/RP1)

Working with the data, we looked for commonalities and divergences among the AMI teachers' experiences to create explanations, pose hypotheses, and develop theories. We looked for evidence that confirmed or disconfirmed our theories. In the early stages of the data analysis, we wrote analytic memos that we shared with each other as we sought to understand patterns in the emerging data. Later, we wrote brief profiles on each teacher for each finding. These profiles could be compared for similarities and differences in contexts, program types, and how teachers applied MI theory. We also developed and used matrices to categorize data from all the AMI teachers. Some of these matrices are included in the Findings section that follows.

We expanded four teacher profiles, which are included in the Findings section. We used profiles for both analysis and presentation. The unit of analysis was the individual teacher. We tried to balance data analysis strategies that categorized data with contextualizing strategies that looked at each teacher's experience more holistically (Maxwell & Miller, 1991). We sought to uncover differences and similarities between the teachers' experiences, and we analyzed relationships between the data sets we had generated with a categorizing strategy. For example, our data analysis revealed a significant relationship between the category MI as Content and the category Assessment, and we began to view these categories as aspects of a larger theme that we later named MI Reflections. Likewise, we saw that the categories Teachers' Perceptions of Students and Teachers' Perceptions of Student Reactions overlapped and were difficult to distinguish in the data. Therefore, we combined these two data categories in the later stages of data analysis. All this data became the basis for MI Reflections, a major theme in our findings.

Validity

Maxwell (1996) proposes several types of validity for qualitative research. We will focus on the three types most applicable to our study: descriptive and interpretive validity, and generalizability. Descriptive validity is concerned with the factual accuracy of the account of specific events and situations. It is the most basic aspect of validity (Maxwell, 1992). Interpretive validity is concerned with inferences made from the words and actions of the teachers we studied (Maxwell, 1992). "Generalizability is normally based on the assumption that this theory may be useful in making sense of similar persons or situation, rather than on an explicit sampling process and the drawing of conclusions about a specified population through statistical inference" (Maxwell, 1992, p. 293). Sampling is purposeful rather than random as in quantitative studies.

Maxwell points out that qualitative studies are not usually designed to allow systematic generalizations to some wider population (1992). Internal generalizability

refers to generalizations that can be made within a group or community being studied, such as an ESOL program, as opposed to external generalizability, in which results are generalized to other groups, schools, or communities, such as all adult ESOL programs.

Descriptive Validity

The AMI Study employed three data collection methods that provided descriptive validity: 1) observations and field notes of site visits (audio or videotaped); 2) teachers' journals (3+ pages/month); and 3) interviews with AMI teachers (audiotaped and transcribed). These three methods supported the "factual accuracy" of our findings through the triangulation of at least three data sources across our analytic categories.

Our field notes and observations followed standard qualitative research protocols. Description was kept separate from interpretation. Observations included the environment and physical context, the sequence and time intervals of the activities, and total observation time. Teachers reviewed the transcribed observations, field notes, and interviews for accuracy. The teachers documented their class sessions, observations, and lessons—MI-based or not—in their journals. Some teachers wrote extensively about their classroom efforts and their thoughts and feelings about teaching. The qualitative interviews gave the teachers an opportunity to clarify, explain, and reflect on an observed session and other study issues.

Interpretive Validity

We tried to understand and articulate how teachers interpreted MI theory. With this, we might be able to explain how MI theory could support their instruction and assessment more generally. Therefore, the AMI teachers' emic/insider perspective on what MI theory offered them and their students was paramount to our success. Rather than offer particular interventions for the teachers to implement, we provided an array of theoretical and practical examples the teachers could choose, adapt, develop, or ignore. In fact, the teachers were not necessarily required to implement MI-informed activities. Teacher research is well suited to this purpose because it is by definition grounded in the subject's perspective.

Monthly journals submitted over 15 months yielded a rich data set of teachers' own words. These were complemented by the teachers' interviews, their remarks on the AMI listserv, and notes from phone conference meetings and the seven AMI institutes in which they participated. In addition to following a common set of questions for each round of interviews, we also followed up on our (observer)

questions that emerged about specific elements of the class. The co-directors shared interview and observation transcripts with the respective teachers to check for accuracy.

In some instances, our theoretical constructions differed from those of the teacher researchers. For example, we did not concur with Wendy Quinones' and Betsy Cornwell's identification of certain behaviors by students as resistance to particular learning requirements (unrelated to MI theory). Cases of our interpretation differing from the teachers' are stated in the Findings section.

As teachers wrote their individual research reports, we discussed their theoretical constructions with them, particularly addressing the validity of relationships they postulated among certain concepts—for example, crediting MI theory for a positive effect. In particular, we tried to ensure that findings were well supported in the data. At times our queries about teachers' interpretations generated a healthy debate over what makes a legitimate finding.

Generalizability

The sampling in the AMI Study was purposeful in that the 10 teachers were chosen through an application process based on clear criteria. We do not claim internal or external generalizability. We cannot infer that the practices of a given AMI teacher would always yield the same results in a similar context. On the contrary, we found that the same MI practice with different groups of students obtained very different results. Wendy Quinones, for example, found that her MI-inspired movie-viewing guide was highly successful with one group and did not work with another. The variables that had changed were the characteristics and group dynamics of her students. Lezlie Rocka found that although one group of beginning reading students embraced active learning choices, the next group was, overall, more shy and hesitant to venture beyond conventional choices. On the other hand, some AMI teachers experienced success with the same or similar MI approaches across different student groups.

Within these parameters, the AMI experience produced a level of guidance and some viable choices for adult literacy educators developing MI practices in their own settings.

Researcher Bias

Both AMI Study co-directors began the study expecting MI theory to have something positive to offer to adult literacy education. For example, we expected

that consideration of the many ways to be intelligent would prompt teachers to learn more about their students' talents. Our assumption did not bear out across the board. We also had to adjust our expectations to the emerging reality of problems and complexities in applying MI theory at various levels of adult literacy education.

As co-directors responsible for helping teachers identify and articulate their findings, we treaded a thin line between assisting them in their efforts and influencing their findings. We hoped that the collegial climate of respect, trust, and earnest dialogue that had developed over the 18 months of the teacher research phase allowed the teachers to feel comfortable contesting our suggestions. Each teacher wrote two drafts and a final version of her research report. The co-directors and teachers agreed that the final report represented the most honest and accurate presentation of their findings.

CHAPTER 3: AMI CROSS-SITE STUDY FINDINGS

Introduction

MI theory is a definition and a conceptualization of human intelligence. It is not—and does not prescribe—a particular approach or set of activities (Baum et al., in press; Campbell & Campbell, 1999; Chen et al., 1998; Gardner, 2000). MI theory offers a specific conceptualization of intelligence, elements of which have implications for classroom practice, just as the traditional view of intelligence has implications that we see manifested in practice (Baum, Viens, & Slatin, in press; Gardner, 1991 & 1993).

Many common MI practices and program elements reflect the theory's major tenets. By tenets, we mean the central characteristics of intelligence from a multiple intelligences perspective. The tenets are:

- Intelligence is a biopsychological potential to solve problems and fashion products that are valued in a community or culture
- Intelligence is pluralistic; there are at least eight intelligences
- Intelligences operate in combination when applied in the real world
- Every individual has a unique profile of intelligences, including different areas of strength and distinctive profiles of intelligence

Because multiple intelligences describes a theory rather than a particular approach, its tenets serve as a guide to developing practices that are distinctively fitted to particular contexts and for particular content. Therefore, although MI-based practices share these tenets, they can be—and are—quite distinct from one another, depending on the context and content (Baum, Viens, & Slatin, in press; Gardner, 2000; Kornhaber & Fierros, 2000). Program and teacher goals, as well as the idiosyncrasies of individual classrooms, play significant roles in shaping how MI theory is interpreted.

One coding category, Teachers' Interpretation of MI Theory, refers to how the AMI teachers' understood and applied MI theory. In our analysis of the AMI data we identified two broad categories of teachers' interpretation, which we termed MI-Inspired Instruction and MI Reflections. These categories are distinguished by their distinct sets of pedagogical goals. Goals for efforts under the MI-Inspired Instruction umbrella focused on classroom practices and materials. Under the MI Reflections umbrella, they focused on the students themselves and on using MI to engage students in reflection about their own strengths, weaknesses, interests, and

preferences. (These goals are explained in more detail in the MI-Inspired Instruction and MI Reflection sections.)

For both MI Reflections and MI-Inspired Instruction, AMI teachers used MI theory as a way to plan and develop activities that called on and/or explored a range of intelligences. To institute MI practices, most of the AMI teachers first analyzed their instruction informally through an MI lens. Based on that analysis, they used MI theory as a conceptual framework to develop activities for MI-Inspired Instruction and/or MI Reflections.

In this section, we report on our major findings. The first set of findings is related to MI-Inspired Instruction:

- Learning activities that drew on MI theory and its central tenets were characteristically authentic
- Learning activities that drew on MI theory and its central tenets were typically relevant and meaningful to students
- MI-informed classrooms became increasingly less teacher-directed and more learner-directed

The second set of findings is related to MI Reflections:

- MI as content can help resistant students
- MI Reflections enhance students' perceptions of their abilities and career aspirations
- MI Reflections are useful for identifying learning strategies for students

Teachers' Interpretation of MI Theory

The AMI Study began in December 1996 with a conference on MI theory in adult literacy education that was open to the public and sandwiched between two full-day support sessions with the AMI teachers and staff. These initial support activities helped establish a baseline understanding of MI theory among the AMI teachers. Subsequent professional development activities that targeted teachers' understanding of MI theory included workshops, experiential activities, role play, facilitated sharing and structured feedback, collaborative writing, shared readings and related discussions, and presentations by guest speakers. AMI support activities regularly revisited MI theory and its major tenets.

Teachers' Understanding of MI Theory was one of the coding categories established early in the AMI Study (see the Research Methods section of this report).

At the root of this category was our assumption that teachers' understanding of MI theory was the primary determinant of how they ultimately put MI theory into action. We reasoned that as a teacher's understanding of MI theory deepened, her practices would develop in direct response and proportion to her level of understanding of the theory.

Early in the study, we began to articulate a continuum of stages representing increasingly sophisticated understanding of MI theory, along which we would plot the teachers (over time) and compare that information with their MI-informed practices. We found that teachers' levels of understanding were rather difficult to ascertain apart from their MI practices. Beyond the early stages of understanding, teachers' understanding and practices of MI were qualitatively different rather than more or less sophisticated. This was caused, in part, because we could not separate teachers' understanding of MI theory from their application of it. Teachers' understanding of MI theory reflected their practices just as much as their practices reflected their understanding.

Furthermore, we found that the teachers' understanding and application of MI theory was bound to several factors, including their pedagogical values and practices, aspect(s) of MI theory on which they focused their efforts, their amount of teaching experience, and their program context and goals. Each of these factors, to varying degrees, interacted with and helped shape the teachers' understanding and application of the theory.

Recognizing that the teachers' understanding of MI theory and their classroom applications of the theory cannot easily be separated, we reconceptualized the data coded under the categories Teachers Understanding of MI Theory and Multiple Intelligences Lessons to form a new category, Teachers' Interpretation of MI Theory.

Key Factors in Teachers' Interpretations of MI theory

We identified three factors that played a central role in shaping how the AMI teachers put MI-Inspired Instruction and MI Reflections into action in their classroom practice:

- Teachers' beliefs about teaching and learning
- Teachers' formal training and prior teaching experience
- Type of class (ESOL, ABE, GED/diploma prep)

To understand the AMI teachers' beliefs about teaching and learning when they entered the AMI Study, we asked two questions in their applications: What are your basic beliefs about how adults learn? How are these beliefs manifested in your teaching? We also coded relevant data in the monthly journal entries the AMI teachers submitted.

These three factors, at least in part, shaped the features of MI theory that each teacher chose to emphasize and how, or in what context, she chose to implement MI. Some teachers prioritized intelligence profiling, the practice of identifying each student's particular collection or profiles of intelligences (their strengths and levels of ability across the eight intelligences). A few teachers looked to Gardner's definition of intelligence and its focus on problem-solving as a touchstone that then led to an emphasis on instructional applications of MI. Several AMI teachers interpreted MI theory's main message—that intelligence is pluralistic—as a call for new ways of teaching that used their students' different intelligence strengths. The extent to which and in what combinations the factors contributed to the teachers' practices varied. The factors came together in distinct ways to influence individual teacher's interpretations of MI theory (see Figure 8).

Figure 8: Factors that Affected AMI Teachers' Interpretation of MI Theory

Teacher	Formal training and K–adult teaching experience	Type of class	Pre-existing beliefs about teaching and learning (from teachers' applications)	Features of MI theory emphasized
Betsy Cornwell	4 years teaching	ABE Diploma Citizenship ESOL	Takes "delight in finding each student's favorite learning approach" and is very aware of her students having "different talents and learning styles that don't match traditional methods of teaching."	Intelligence profiling Definition of intelligence focused on problem-solving
Meg Costanzo	23 years teaching, 20 at middle-school level	GED and diploma All subjects	"Learners differ in their preferences for learning modes and strategies. Maximum learning takes place when a student works with materials geared to her style. When teaching a new concept, I make info available through different senses."	Intelligence profiling Definition of intelligence focused on problem-solving Different intelligence strengths call for different ways of teaching
Terri Coustan	35 years of teaching, 7 in adult ESOL	ESOL literacy	Adults have "a variety of cognitive strategies and learning styles. They come influenced by their culture and environment."	Intelligence profiling Different intelligence strengths call for different ways of teaching Definition of intelligence focused on problem-solving
Bonnie Fortini	6 years of teaching	Math	"People learn by using their individual profile of modalities. Learning moves from awareness to cognition to reflection to connection and utilization."	Intelligence profiling Definition of intelligence focused on problem-solving
Martha Jean	24 years of teaching, 6 in adult education	GED All subjects	"Adults learn through experiences such as imitating, imagining, doing, observing, reading, computing, experimenting. For some, the experiences need to be auditory, tactile, olfactory, visual, spatial, kinesthetic."	Different intelligence strengths call for different ways of teaching
Jean Mantzaris[10]	15 years	Career planning	"Adults learn in a variety of ways, in teams, on their own. Some are auditory, others visual learners, many are bodily-kinesthetic."	Intelligence profiling Different intelligence strengths call for different ways of teaching

[10] Jean Mantzaris came on board in October 1997 to replace Diane Marlowe, who left the study in June 1997.

Figure 8 continued

Teacher	Formal training and K–adult teaching experience	Type of class	Pre-existing beliefs about teaching and learning (from teachers' applications)	Features of MI theory emphasized
Diane Marlowe	12 years	ABE GED All subjects	"Each student has his or her own learning style and strengths and weaknesses and talents, yet virtually all learn best experientially— by doing rather than just reading or listening. Learning flourishes when materials are relevant to students' lives. Students need to have voice in the educational process."	Definition of intelligence focused on problem-solving Different intelligence strengths call for different ways of teaching
Wendy Quinones	8 years	Transition to training, college or work	"Adults learn in a variety of ways, by doing, hearing, drawing, speaking, reading. Most adults learn best when their life experience is integrated into learning. . . . I am committed to the philosophy and practice of popular education . . . that empowers and joins together oppressed people and otherwise powerless people so they may collectively improve both their own condition and that of the world around them."	Different intelligence strengths call for different ways of teaching
Diane Paxton	3 years	ESOL	"Adults learn best when they can access and build upon what they already know with themes that come from students' lives."	Different intelligence strengths call for different ways of teaching Definition of intelligence focused on problem-solving
Lezlie Rocka	2 1/2 years in education, 1 in ABE	Basic reading and writing	"People learn using multiple senses. . . . When strengths are capitalized on learning occurs more easily. . . . Success leads to confidence, which motivates more learning."	Different intelligence strengths call for different ways of teaching

Teachers' Beliefs about Teaching and Learning. There is a remarkable consistency in the AMI teachers' espoused beliefs. All the teachers expressed the view that adults have different ways of learning and would benefit from the availability of a variety of learning strategies. They also shared a belief in the importance of using content that is relevant to students' lives outside of the school context.

As might be expected, the AMI teachers' beliefs about teaching and learning became more nuanced and perhaps even more based on experience. Most of the teachers expressed new appreciation for the diversity in how people process information and make sense of new material. Their MI-based lessons allowed them to witness this diversity. Lezlie Rocka, for example, learned that adding nonlinguistic elements to a reading comprehension activity improved her students' reading comprehension (Rocka, in Kallenbach & Viens, 2001, pp. 211–214). Regarding her class's accompanying a classmate to court, Wendy Quinones noted:

> MI's validation of different intelligences so enlarged my conception of what constitutes learning that I could regard this court visit as an activity that met the educational goals of my program, thereby permitting the very collective empowerment I had been struggling for so long to produce. (Quinones, in Kallenbach & Viens, 2001, p. 188)

Jean Mantzaris changed her beliefs about the ideal mode of teaching and learning. As a guidance counselor, Jean typically worked with students one-on-one. Until her AMI involvement, she had considered the one-on-one instructional format the best way for people to learn. Her interpretation of MI theory led her to design group learning activities through which individuals shared their personal experiences and preferences with their classmates. Jean's positive experience with group instruction led her to the following conclusion:

> In this semester of MI-inspired career decision-making, I was struck with the realization that our students are isolated at our learning center. This was the first time students participated together, and this participation was remarked on, not only by myself, but also by the students themselves and staff. ABE/GED teachers commented on how energized the students were becoming. (Mantzaris, in Kallenbach & Viens, 2001, p. 142)

Teachers' Formal Training and Prior Experience Teaching. An analysis of how the AMI teachers interpreted MI theory suggests that formal training and/or six or more years of prior experience teaching similar subject matter facilitated the teachers' process of applying MI theory in instruction. The more teaching experience or recent formal training in education, the more varied the repertoire of teaching strategies.

The more diverse the teachers' repertoires of strategies, the more intelligences are likely engaged.

All but the two least experienced/formally trained AMI teachers were already using different teaching strategies that incorporated drawing, movement, and the arts to appeal to different senses and different intelligences beyond the traditionally emphasized linguistic and logical-mathematical. These teachers used MI theory as an impetus for implementing even more varied teaching strategies with greater frequency than their less-experienced colleagues. For experienced teachers, such as Martha Jean and Meg Costanzo, adding MI theory to their lesson planning felt more like a logical extension of the ways in which they were already teaching. For Betsy Cornwell and Bonnie Fortini, applying MI theory in practice represented a considerable leap from the way they were used to teaching. Their teaching strategies were more limited and workbook-based, yet they were also guided by efforts to use examples from students' lives and to build on what the students already knew. Intelligence profiling figured prominently in how these two teachers interpreted MI theory. Having students reflect on their intelligences and related attributes, such as their problem-solving approaches, added new content to the lesson but did not require them to change their teaching of the other content. The fact that Betsy and Bonnie had relatively few years of teaching experience and limited formal training in education may account partially for the gap between their espoused beliefs and their actual teaching practice. (Betsy was trained as a piano teacher and Bonnie as a bacteriologist.)

Type of Class (ESOL, ABE, GED/adult diploma, career counseling). Each type of class presented its own opportunities to apply MI theory, but the AMI teachers' interpretations of MI theory were in some ways constrained by the type of class they taught and its related learning objectives. In some cases, the AMI teachers were limited in the degree they could apply MI theory.

GED and adult diploma students are driven by the goal to pass the GED or to get an adult high school diploma. Both Martha and Meg found that as their diploma and GED students approached test readiness, they needed to transition from more diverse, MI-informed approaches to more narrow test-preparation strategies. At that point, test-ready students wanted and needed practice with specific test materials and test-taking skills. Both teachers also concluded that choice activities with more narrowly defined learning objectives were more effective.

The concepts of MI theory are difficult to convey at beginning ESOL levels if the teacher and students do not have a shared language. In the opinions of the two AMI ESOL teachers, teaching about MI theory was not worthwhile, given the other

content they needed to teach. Terri Coustan thought that low-level ESOL learners could not benefit from being introduced to MI theory because "they have difficulty using abstractions." However, both teachers saw the value of engaging students in reflecting on their learning preferences. They saw this kind of reflection as integral to students' self-knowledge, a fundamental dimension of intrapersonal intelligence.

The degree to which the teachers felt their interpretations of MI theory were constrained by course objectives seemed to vary according to the teachers' pre-existing teaching style and their level of comfort and readiness to try new teaching approaches. For example, the secondary-level math teacher with the least teaching experience felt MI-based teaching was a nearly impossible fit with a sizable math class, but two more-experienced math teachers did not perceive math content as a constraint.

AMI Teacher Profiles: Pictures of MI Interpretation

Teachers' interpretation of MI theory is best understood in context. Therefore, we present profiles of four AMI teachers: Martha Jean (Pre-GED/GED), Diane Paxton (ESOL), Betsy Cornwell (ABE and adult diploma), and Meg Costanzo (adult diploma). The profiles detail how these teachers made sense of MI theory in their own settings. They also illustrate how the three key factors (beliefs about teaching and learning, formal training and prior teaching experience, and type of class) came into play in each teacher's adaptations of MI theory. The profiles show each teacher's distinct MI practices, with many common elements across the AMI classrooms.

PROFILE I: MARTHA JEAN

Background

Martha Jean started teaching in a pre-GED and GED program for homeless adults in 1990 at Community Action, Inc., in Haverhill, Massachusetts. Martha joined the Young Adults with Learning Disabilities (YALD) Northeast Team in 1994 and has served as its director since 1996. Martha felt it was important to advance her understanding of the learning needs of students with learning disabilities and Attention Deficit (Hyperactivity) Disorder (AD[H]D) because a large proportion of her students typically were part of this group. Martha wrote in her AMI Study application:

> I recognized two things about these adults. Many learned differently and many also had skills that their schooling had not supported or fostered. However, since most of them wanted or needed a GED, it became important for me to recognize their learning differences/disabilities to help them pass the test. (Jean, AMI application, October 1996)

Martha saw MI-based practices as a logical continuation of her efforts to address the special needs and abilities of these students while helping them gain the skills needed to pass the GED exam. Martha wrote:

> As a . . . teacher and as the present director of Northeast YALD, I have come to realize in a more intense way that standard classroom models are not workable. . . . If [adult students] are to become lifelong learners, they need to recognize their gifts and how to grow with them. I would like to participate in this research because I believe students will have opportunities to learn in the AMI Study through formats that respond to their varied modes of understanding. I would like to facilitate that opportunity. (Jean, AMI application, October 1996)

At the time she joined the AMI Study, Martha was teaching in two pre-GED/GED programs, one specifically designed for homeless adults. Each group of four to eight individuals met twice a week for three hours. As Martha had reported, many of her students had been formally diagnosed as having learning disabilities and/or AD(H)D. Others had not been diagnosed but displayed LD or AD(H)D characteristics and behaviors. Martha came into the study wanting to help these students, knowing that they had difficulty focusing on "regular" GED preparation materials, were frequently absent, and typically left the program before completing it.

Martha firmly believed that all her students possessed different ways of learning based on their distinct strengths. She also believed she could help her students stay in the program and attain their goals by offering learning opportunities that spoke to their particular intelligence-area strengths. She saw MI theory as a tool to articulate and account for those differences in the classroom. Given Martha's primary focus and goals as an instructor, she entered the study with an understanding of MI theory that emphasized two of its key tenets: There are several ways to be intelligent, and we all have potential in all the intelligences. Martha's existing goals and efforts in the classroom shaped how she understood MI theory and were the building blocks on which she set her AMI Study efforts.

Focusing on Course Goals

Martha began her AMI work focused on her GED preparation curriculum by inviting a range of intelligences, particularly her students' strengths, into the classroom. She had worked on expanding her repertoire of learning activities before participating in the AMI Study. For example, to help her students prepare for the essay part of the GED exam, she created diverse types of writing experiences for the students: responding to artwork in writing, writing to state representatives about an important issue, conducting and writing up observations, and writing to incarcerated partners about a mutually important issue.

Martha began her MI effort by analyzing her classroom offerings in relation to the range of possible entry points into course material that MI theory suggested to her. Her first insight was that her existing creative efforts tended to be spatial or linguistic. Martha used her understanding of the eight intelligences to guide her development of activities in other areas, beginning with the musical, bodily-kinesthetic, and logical-mathematical intelligences. For example, she engaged her students in writing by using magnetic words, music, and personal reflection ideas as new types of prompts.

Given contextual factors in her setting—high absenteeism, high transience, and high LD/AD(H)D rates among students—Martha focused on creating short-term, in-class experiences rather than projects that spanned class sessions. Her students could begin and complete one or two activities in one class session. New types of experiences attracted this group of students to the sessions. Missed sessions or homework did not keep them away, as there was no fear of falling behind on a multi-session activity.

In contrast to most of her AMI colleagues, Martha—and her students as well—did not feel hesitant to do these unfamiliar MI-informed activities. Martha's students were not concerned, as many of their peers in other programs had been, that these hands-on activities were juvenile. Martha herself had often wondered, "What happens to the fun stuff after kindergarten?" She had always made an effort to move beyond the GED workbooks to engage her students more actively. Although the MI activities were new to the students, they seemed to fit into Martha's pre-existing approach in the classroom. Rather than being hesitant or wary, her students responded positively to the new activities.

Nonetheless, Martha thought it was important to explain to her students the reasons for what they were doing. She always attempted to make a clear connection between the MI activities and students' GED goals. She drew the content of her MI

activities from the GED exam and explained this to the students. Typically, an MI-inspired activity would be followed by work in the GED workbooks.

Martha created opportunities for students to engage in MI Reflections activities in the Learning About MI format. Martha offered her students such hands-on activities as reconstructing a MI Wheel[11] like a puzzle, distributed MI information sheets that they discussed in class, and facilitated reflections that explored the intelligences at work in activities they had completed. Martha limited these MI Reflections activities to two or three class sessions per group—enough time for students to understand the rationale for her new MI-inspired practices.

Martha also regularly solicited student input into session topics. Her students seemed to appreciate Martha's MI approach because she focused on using MI to advance their specific learning goals. Her students repeatedly referred to "having fun while learning" as a central reason why Martha's MI-informed approach helped them prepare for the GED (Jean, 1998). Martha's interpretation of MI was always yoked to the primary goal of preparing students to take the GED exam.

MI Practices Refined

Martha refined her MI approach to incorporate diverse entry points into the course material, without straying from the key goal of helping students prepare for the GED. She further developed her MI instructional efforts by creating a choice format for using MI theory well in her classroom, fine-tuning individual MI activities to fit specific GED goals, and identifying where MI-informed experiences fit best along each student's GED preparation timeline.

Introducing Choice. Martha began her application of MI theory by developing new types of activities that she implemented with the whole class. As she put it, "That way, I knew everyone was receiving the information" (Jean, interview, May 5, 1997). However, Martha soon concluded:

> Making all students do all the MI-based activities I designed was only somewhat better than making them do only workbook activities. I thought they benefited from the opportunities to learn through their areas of strength, but I was still requiring them to use methods that had rarely worked for them in the past. (Jean, interview, March 19, 1998)

[11] The MI Wheel is a circle with the following information in concentric circles: intelligence (spatial, music, etc.), definitions of each intelligence, individuals who are exemplars in each intelligence, and tasks and roles that use each intelligence to a great extent. Each item is in a space that can be cut out, so the whole wheel is like a puzzle.

Martha introduced choice into her MI activities so her students could explore the GED material in a way they preferred or, presumably, a way that fit their strengths. Martha designed a Choose 3 approach that allowed students to choose 3 (out of 9 or 10) options to engage in a topic. An example of this can be found in Figure 10 (p. 67). She used MI theory in the same way she had applied it to developing whole-group activities; however, in the Choose 3 context, students were provided all the options at once and chose among them. Martha assumed students would choose the areas and activities that made the most sense to them, were easiest, and/or were most comfortable and of greatest interest to them. Martha notes:

> When I'm designing a Choose 3, I generally look at the GED-related material, then start thinking about how each intelligence could be used to learn that information. So, someone who has spatial ability might like tracing or coloring, someone who likes to use their body to learn might like walking through or around visual information on the topic, and someone who likes numbers might like to graph the new information. (Jean, journal, January, 1998)

With the Choose 3 format, Martha drew heavily on the notion of unique profiles and differentiated learning. This approach worked successfully to provide fitting options for her students and to help them connect to GED topics, keep them interested, and help them progress. Her students' positive response to this format and to the variety of hands-on experiences, as well as their improved attendance and focus on tasks, encouraged Martha to stay with the Choose 3 format to integrate MI theory into her practice.

Fine-Tuning MI-Informed GED Preparation Activities. Martha identified a need to fine-tune how she designed the Choose 3 topics and activity choices. In particular, Martha found that some Choose 3 topics were not focused enough for her students. For example, students noted that the planets Choose 3 had too much content to cover in one Choose 3 lesson. Similarly, some subjects, such as geometry, needed to be broken down into smaller chunks over time and over several Choose 3 lessons for students to get in-depth work in each key area. For example, Martha created an angles Choose 3 based on her students' feedback about the skills and topics on which they needed work.

Such fine-tuning moved the activities away from what might be considered more holistic or authentic instantiations of the intelligences toward a realistic use of MI theory for this particular context. Topics might not be broken into these smaller chunks in real-world problem-solving, but the students needed this to prepare for the GED exam. This shift to Choose 3 developed around specific skill or knowledge areas helped Martha better address her students' particular learning needs for the GED and still gave them a variety of ways to learn. In Martha's words:

> I learned that in a GED preparation context, there is a benefit to MI-informed curriculum, to using a range of ways into content, and to giving students opportunities to approach content through areas of strength. However, over the course of the study, I learned that there is also a balance that needs to be maintained between using a range of MI based entry points across a theme . . . honing in on students' particular test-preparation goals. (Jean, in Kallenbach & Viens, 2001, p. 124)

Fitting MI into the GED Preparation Trajectory. Martha's students also helped her recognize what might be called a GED preparation continuum. Martha found that as test-taking time approached for individual students, their needs moved from gaining familiarity with content and mastering certain skills to preparing to take a test. In other words, students who were ready to tackle the test content still needed to be skilled in the elements of successful test-taking, such as employing reading strategies, using a multiple choice format, and taking a timed test.

Martha recognized that the GED-preparation continuum needed to phase in test-taking practice and phase out MI choice activities when students were ready for the test content. Through student feedback and personal observations, she concluded that "there is also a balance that needs to be maintained between using a range of MI-based entry points . . . and honing in on students' particular test preparation goals" (Jean, in Kallenbach & Viens, 2001, p. 124). As Martha describes it:

> An understanding that students will need different types of activities at different times is already embedded into my approach. . . . But I also learned that individual students' needs change as they prepare for the GED. GED preparation can be seen as a continuum. Early in the continuum, students—specifically ADD or LD students—are best served by giving them opportunities to learn material in many ways, especially ways that make the most sense to them. But when students are approaching that time when they are test-ready, they need to focus their attention on specific content areas and on test-taking skills.
>
> Over the course of my study, I gained (and continue to gain) insight regarding when and how to use MI-based, specifically Choose 3, activities in relation to this GED preparation continuum. My realization that there was a time to quiet the MI tone of the class, and modifications I made to my approach in response, represent the beginning of a probe into when, where, and how one uses MI to help students prepare for the GED. (Jean, in Kallenbach & Viens, 2001, p. 124)

Profile I Conclusion

Martha Jean's experience presents an excellent example of how MI theory can be assimilated into existing goals and approaches. For Martha, integrating MI theory

involved focusing on two of its key features: that there are several intelligences and that we each have different collections of intelligences and preferred ways of learning. The theory became a framework that Martha used to create classroom activities addressing her students' range of intelligences while helping them prepare for the GED exam. Her focus, then, was on MI-Inspired Instruction, using MI theory as a tool for enhancing the curriculum. She saw MI theory as a way to personalize the GED preparation curriculum for students, without necessarily individualizing each lesson, by offering different entry points through which they could engage in the material.

Over the course of the AMI Study, Martha explored and refined her interpretation. She maintained a focus on using MI theory to enhance her curriculum, particularly for LD and homeless students. She fine-tuned her curricular MI efforts, creating and modifying a choice approach and creating an appropriate place for MI-informed activities within each student's GED preparation experience. Martha's goals for her students did not emphasize MI Reflections, which remained at the Learning About MI level, to provide a rationale for the new MI-based practices she instituted.

With Martha's clear and careful connection of the MI activities to GED preparation and her typically hands-on approaches, students responded positively to the MI activities. Ongoing student feedback informed Martha's subsequent practices and helped her refine her MI approach continuously in ways that more successfully addressed students' learning goals, strengths, and preferences.

PROFILE II: DIANE PAXTON

Background

Diane Paxton came to the AMI Study with three years of experience as an adult ESOL instructor and a recently earned master's degree (M.A.) in teaching English to speakers of other languages (TESOL). While in graduate school, Diane co-taught a freshman remedial writing course with a university professor and studied the effectiveness of the reading strategies they used in the course. Previously, Diane worked in the arts and theater, teaching millinery methods, dye techniques, and costume design and construction.

To the AMI Study and to her interpretation of MI theory, Diane brought an approach to ESOL instruction driven by certain theories and thinkers, including Paulo Freire (1994) and Steven Krashen (1982). Drawing on these and other

theorists, Diane espoused and used student-centered, multimodal approaches that drew on students' experiences, skills, and interests. She continuously strived to embed direct language skills instruction into the use of English in situations that were meaningful to her students.

Diane had the critical, reflective lens of a teacher researcher, noting in her application, ". . . one of the most important aspects of teaching is an inquiry into the theories behind one's own teaching practice, methods, and curriculum development" (Paxton, AMI application, October 1996). In her application, Diane also emphasized the value of students' awareness of learning strategies that work for them.

Diane believed that "using multiple intelligences in classrooms with adults can give both structure and depth to curriculum." She felt that her students, English learners with low-level native language literacy, would ". . . learn best in a classroom situation which encourages them to access the diversity of their collective multiple intelligences, not one which is based in traditions of academic styles and displays of 'intelligence'" (Paxton, AMI application, October 1996).

Diane saw the AMI Study as an opportunity to pursue three strands of her practice: conducting teacher research, enhancing her classroom offerings through a multiple intelligences framework, and providing richer grounds for her students' reflections on their learning strategies.

MI in Practice as Profiling Students

The El Centro Hispano Study. When the AMI Study began, Diane was teaching a group of elders at El Centro Hispano, in Chelsea, Massachusetts. Despite being in the United States for several years, most of Diane's students spoke very little if any English. Most possessed only limited literacy skills in their native Spanish. Diane began her research study by asking, "What effect does metacognitive awareness of their own multiple intelligences have on the perceptions of effective ESOL teaching and learning by students with limited native language literacy?" This question positioned Diane's work with MI theory within the context of her pre-existing efforts to help students develop their metacognitive abilities. It placed Diane's efforts soundly in MI Reflections, given her goal that students become aware of their own multiple intelligences.

Diane also wanted to explore her integration of MI theory into the curriculum. She wanted to understand:

> whether a focus on diverse, multiple intelligences–informed approaches to curriculum would help the students practice and acquire English more effectively and help them appreciate and value a less traditional, more diverse, and holistic approach to acquiring English. (Paxton, report, July 1998)

Diane reports that two events shaped her early understanding and application of MI theory. The first was a talk by a well-known MI educator, Thomas Armstrong, who stated that "the single most important aspect of MI is passing the awareness of individual profiles on to your students. This way they can use it, apply it, and gain greater control of their lives and learning through their strengths" (Paxton, report, July 1998; Armstrong, 1997). The second key event for Diane's early understanding of MI theory was a presentation at an AMI institute by Dr. Branton Shearer, whose own efforts with MI applications focus on identifying students' strengths using his Multiple Intelligence Developmental Assessment Scales (MIDAS), a self-report measure (1994).

For Diane, the primary message of these MI experts was that putting MI theory into practice presumed assessing students' intelligences and producing definitive profiles of their strengths. The fact that one of the lectures took place during an AMI institute suggested to Diane an official AMI sanction, if not a mandate. Diane's own emphasis on metacognition led her to not only seek to identify students' strengths, but also to engage her students in MI-based self-assessment. Self-assessment is a much more difficult task with students who have limited English skills and metacognitive experiences in the classroom. Rather than asking simply how she could identify her students' strengths, Diane also asked how she could involve her students in considering their own intelligence-based strategies to learn English.

Diane began by teaching her students about MI theory. She created reflection activities and facilitated class discussions about the theory and its application in their own lives. Diane's students expressed minimal interest in exploring the theory and their own strengths, perhaps seeing little relevance in this abstract theory to their own purposes in attending the class. At the same time, Diane herself was questioning the practice of assessing students' intelligences. Diane noted:

> I felt a push to assess individual intelligences as an important part of putting MI theory into practice. . . . However, for my students and teaching context, I was developing thoughts that this was not useful to the students in terms of us spending classroom time on it and their applying knowledge of their intelligences to their learning. So I resisted and problem-posed around this emphasis in application of MI theory. Since I was only at the beginning of my work with the theory, and this

> questionable area had been strongly emphasized, this caused me to wonder about the usefulness of the theory for my teaching context. (Paxton, journal, March 1998)

In her journal, Diane described her doubts about the value of assessing students' intelligences:

> I would venture to say that every adult student has stories of the development or estrangement of their intelligences which are at least as complex and difficult to entangle as mine. For me, this is really starting to call into question the part of MI that stresses that individuals investigate and become familiar with their own intelligence profiles. This is a complex process that depends on many things. Given the usual context of the 4–6 hour a week adult ed class, well, it's a tall order to think that teachers and students can put enough emphasis on seeking these profiles to arrive at something which might be accurate enough to be applied helpfully in other areas of life and learning. (Paxton, in Kallenbach & Viens, 2001, p. 160)

Diane's doubts can be categorized as follows:

- Her strong doubts about being able to assess students' intelligences accurately because of the complexity and the confusion of intelligences with other factors, such as students' coping mechanisms, hobbies, and learning preferences
- Her belief that developing real awareness of students' strengths involves offering and observing students across many different kinds of learning opportunities over several weeks
- Her difficulty in undertaking metacognitive activities or raising the metacognitive awareness of a group of students such as hers (low-level native-language literacy, elderly, disinterest in "abstract" theories, etc.)

Diane also felt that her students' expectations of traditional schooling left little room for ruminations on intelligence.

MI as Curriculum

While struggling with issues of assessing students' multiple intelligences, Diane was also taking steps to integrate MI theory into her teaching. She considered the different intelligences and brought new activities to units and projects, including a particularly successful project on natural remedies (Kallenbach & Viens, in press).

Diane remarks, "As I look back, I see that talking about MI is not as important as just doing MI, especially with this group of students" (Paxton, report, June 1997). At that point, Diane had abandoned her assessment of students' strengths and

seen some success in her use of MI theory to enhance her teaching. Diane also saw that including MI-informed activities might have further contextualized course content for her students. However, because she was already doing MI in spirit, Diane struggled with how to build MI theory intentionally into her curriculum. She felt that much of what MI theory called for already happened in her classroom and that her insights could easily be explained in other ways. For example, she notes:

> I can see now that it would have been better (and has now been better) to approach their work on this book from diverse areas of their intelligences first, and then attach the intimidating writing part to it. This would have given the students a sense of confidence and understanding of how to express themselves on the topic on English first, drawing on other areas of their intelligence strengths, before asking them to jump into the linguistic intelligence area. So, developing the knowledge in areas in which they are strong, and then asking them later to use it, try it out, in an area that they are not so strong in . . .
>
> This is really common sense, knowing that students need diverse ways into a topic before they can be expected to perform in it. I know this about preparing students on many levels already, not only as it applies to the area/my experience with MI theory. (Paxton, journal, May 1997)

Diane turned to her rich background of theory and practice to develop and explain what happened in her classroom. MI theory seemed to be running interference. She understood and explained the events in her classroom from the perspective of her pre-existing theoretical anchors. At the same time, Diane also identified positive insights and outcomes from her AMI work:

> Thinking about the definition of intelligence from an MI perspective helped me to integrate MI theory into my practice. I asked the students to make content connections across various activities in the units, which is a form of problem-solving. . . . I believe that these thematic units also helped to maintain students' interest in the text/content area over a longer period of time. . . . (Paxton, in Kallenbach & Viens, 2001, p. 162)

Here, Diane identified a distinctive strength of MI theory: making students' learning processes accessible to them by personalizing the course material, using MI theory. Interestingly, Diane saw a decidedly metacognitive function in MI: to help students understand how they best learn and incorporate this into their learning strategies.

The Bunker Hill Community College (BHCC) Study. By the second semester of the AMI Study, Diane had moved to an intermediate English class at a community college. Diane focused her MI efforts on adding new activities to existing units that

drew on different intelligences. This evolved into a new "problem space" for Diane and MI theory:

> I mind that writing [my journal] frequently leads me to the idea that I should be doing more MI stuff with the students, and this ends up being a conflict with the other things that I feel are relevant and that I want to be doing with them. There is just not so much time in my class that I want to take away from the things I think are important to spend time developing and assessing MI activities. (Paxton, journal, October 1997)

After giving up trying to assess students' intelligence strengths, Diane began to implement group assessment strategies that asked students to record and discuss the learning strategies and experiences that worked well for them. In December 1997, Diane was rewarded with student reflections in which they shared their appreciation for a variety of English-learning approaches, including activities Diane had developed based on MI theory. Although Diane still struggled with the genesis of those activities—whether they emerged from MI theory or would have emerged anyway from her other theoretical roots—her students' reflections were a small victory.

For Diane, coming into the AMI Study with a thoughtfully developed theoretical stance limited her view of MI theory and the role she gave it in her practice. She described the theory as a hook on which to hang her work but one she did not need. Diane's earliest interpretation of MI theory, as a framework for assessing intelligences, was supplanted by MI theory as a framework for curriculum development. In other words, Diane's emphasis shifted from MI Reflections to MI-Inspired Instruction. In its latter position, MI theory led to what Diane described as "pretty standard ESOL activities" she could easily have generated from the theories she already used to support her practice.

Profile II Conclusion

Diane Paxton's work with MI theory reinforced for her the notion that one must be reflective and critical of any new theories or practices before deciding to implement them. Her understanding of MI theory moved from a framework for assessing students' intelligences to a theory that validates "good ESOL practices." Once Diane understood MI theory as a theory rather than as particular practices—such as assessing intelligences—she felt she was walking the same ground she had already covered with her diverse ESOL practices.

For most AMI teachers, MI theory was a theoretical lens through which to view their classroom practice. For Diane, MI theory was an addition to several

theories she already drew upon. It validated her existing practices that had emerged from her knowledge that students bring a diversity of strengths, preferences, strategies, and interests that she should tap as a teacher. Diane placed MI theory in the position of one lens through which to reflect on and enhance her curriculum, rather than as a theoretical umbrella for all her practices.

PROFILE III: BETSY CORNWELL

Background

Betsy Cornwell brought to the AMI Study 21 years of experience as a piano teacher and 4 years as an adult educator in rural Maine. Betsy's program, Learning Center at Region 9, is located in the small mill town of Rumford, where Betsy taught adults in their homes one-on-one in weekly 90-minute sessions. Depending on the student's needs, she taught any combination of reading, math, history, science, ESOL, geography, GED preparation, and such life skills as balancing the checkbook and parenting. Her students were all parents of young children. "They frequently have deeply emotional responses to learning experiences that must be acknowledged and dealt with if learning is to happen," Betsy wrote (Cornwell, AMI application, October 1996).

In her application, Betsy wrote that she takes delight in finding each student's favorite learning approach. She was very aware of her students' different talents and learning styles "that don't match traditional methods of teaching." Her experience as a piano teacher influenced her view of teaching and learning: "The theory of multiple intelligences resonates with my experience of people who are dumb in school and brilliant on the piano bench (and vice versa). . . . My experience in Even Start with people who are unable to read but are gifted builders, woodsmen, or parents also supports the idea that intelligence depends more on the activity in question than teachers have traditionally believed" (ibid.). Betsy came to the AMI Study with the desire to "learn much more about how to match the curriculum they need to their gifts and thinking patterns" (ibid.).

Intelligence Profiles as the Presumed Catalyst for Improvement

For the first four months of her AMI research, Betsy assumed from her reading of MI theory that her students might be able to improve their learning strategies if they reflected more on their intelligence strengths and preferences. Betsy reasoned that if intelligence is about problem-solving, perhaps MI theory could help students become better problem-solvers. She hoped that if students acknowledged their strengths, they

would become more active and confident learners who use independent, creative thinking to solve problems and to understand learning as more than following directions.

Betsy began to assess her students' problem-solving strategies by presenting them with a hypothetical but plausible real-life problem to solve. Betsy wanted this to be a problem her students could relate to but found unthreatening. She wondered if problem-solving strategies in daily life might transfer to academic subjects. The first problem the students were asked to solve was:

> Your check comes only about once a month, and the next one isn't due for three weeks. You're not worried because all your bills are paid, and you have just enough money to buy groceries for the next three weeks. Then your washing machine breaks down. You call the appliance store, and the repairman says it will cost you about two weeks' worth of grocery money to get it fixed. What do you do? (Cornwell, journal, June 1997)

Almost all students came up with a different solution based on their best judgment of available resources. One man's solution to fix the machine himself led Betsy to wonder how this strength could be used to gain math insights. Another student's decidedly interpersonal strategy caused Betsy to re-examine her quite contrary perception of that student. It is not clear that the students learned new strategies, but Betsy gained new insights, some of which she later used in her instruction. She captured these and other observations about her students' idiosyncratic ways of learning.

Before long, Betsy became frustrated with her attempts to match her students' talents, such as cooking, to specific intelligences:

> I was expecting that I would be able to plug any given activity into a specific intelligence but I've found the reality to be much more complex . . . the complexity sometimes seems like a problem. I realize that deciding which intelligence is dominant in activities like cooking, shopping and child care is more than what I'm going to be able to tackle. . . . I think I need to find a way to help my students build their profiles without being so specific. (Cornwell, journal, June 1997)

Her attempts to share her observations with students and elicit from them the intelligences they used yielded "very little useful response" (ibid.). She also was not satisfied with the students' responses to the learning logs she instituted. In those logs, she asked students to describe a problem they faced, how they were dealing with it, and how they felt about the results. This version of the learning log was largely unrelated to the lessons Betsy taught. Although her focus on problem-solving was

consistent and persistent, it departed from the other AMI teachers' interpretation of MI self-assessment in its singular focus on problem-solving. Betsy later simplified the learning log into two prompts: "This I what we did" and "This is what I think" about the lesson.

Another disappointment for Betsy was an activity she used to get her students to reflect on their strengths by asking them to list sentences about themselves beginning with "I can." She then asked students to compare the items on the "I can" list to the eight intelligences. The less-than-enthusiastic response to this activity caused Betsy to discontinue her attempts to get her students to identify the intelligences they were using. Referring to her students, Betsy writes, "They were frequently reluctant to admit to their strengths. They were suspicious of my attempts to validate abilities outside the recognized academic realm of linguistic and mathematical. I think the discussion of intelligences may have felt invasive for some students. . . ." (Cornwell, in Kallenbach & Viens, 2001, p. 14).

Betsy found that having students reflect on their own strengths and real-world problem-solving strategies was not sufficient for her students to take the leap into creative, independent, critical thinking. MI theory did not prove very helpful to her or her students when her lessons were not MI-based. "If I can find academic activities that relate to their skills, I'm hoping they will be able to make their own connections. . . . My original intent was to have my students develop the intelligence profiles without changing my teaching. Now I think I was assuming too much. I can't expect the concept of MI to be meaningful to them until I give them the opportunity to see it in practice" (Cornwell, journal, June 1997). She, in fact, came back to the idea she had expressed upon joining the AMI study: that MI theory's most appropriate use was to develop lessons that corresponded to students' gifts. This time, her views were no longer theoretical ruminations.

Many Ways of Being Smart: Grounding MI in Daily Living

Betsy's entry into MI-based teaching took place in stages. Initially, she wondered "if my emotional reaction to manipulatives is similar to Steve's reaction to reading? I know I'm going to look stupid in my first efforts. . . . What if my insecurity and clumsiness end up intimidating my students?" (Cornwell, journal, January 1997) Two months later, after reflecting on her teaching practice with her MI lens, Betsy worried about "how verbal and linear I am" (Cornwell, interview, March 1997).

MI-based teaching seemed to be a Pandora's box for Betsy: Once it was opened, there would be no going back. She suspected that if she made one subject more MI-based, it would be difficult to justify not doing the same in other subjects.

"The book on MI in the math classroom. I'm a little afraid to get into it too much because then I'll feel the need to do the same with reading, writing, citizenship, and English" (Cornwell, journal, January 1997). This comment suggests that the prospect of across-the-board curriculum changes felt overwhelming to Betsy at that time.

The value Betsy had placed all along in students' real world talents, interests, and needs anchored her MI-based lessons and moved her beyond her comfort zone. For example, she had her ESOL and citizenship students measure the dimensions of the actual U.S. flag and estimate the dimensions of the Statue of Liberty. The skills embedded in these activities were relevant to the men's work at a mill, where they had to measure things. Another effort to allow students to learn through their real-world talents entailed Betsy observing her Cambodian students cook in their kitchen; afterward, the students wrote the ingredients and directions in English. "I enjoyed today's role reversal a great deal. It was fun to watch their competent, fluid motions in the kitchen" (Cornwell, journal, April 1997).

Two lessons stand out as critical incidents in Betsy's growth as an MI educator. One was an assignment Betsy developed to tap into her student's interpersonal intelligence to help the student complete the geography requirement for graduation. She asked the student to locate the places where the student's favorite celebrities—especially Princess Diana—had lived or traveled. Significantly, Betsy differed in her assessment of the student's self-professed interpersonal intelligence, but she was open to following this student's lead. The other activity consisted of a series of problem-based math lessons that included calculating unit prices for apples, based on price per pound, and comparing different brands of potato chips across several variables (price, fat content percentages, etc.). By introducing real-world math problems and the actual items that the students could manipulate and even eat later, Betsy departed from the predominantly workbook math she was accustomed to teaching. Betsy found that these activities were well-received by the students, which reinforced her application of MI theory.

Although she did not articulate the connection explicitly, Betsy applied MI theory in ways—comparison shopping, cooking, measuring—that can be related to the definition of intelligence as solving problems and creating products valued in the students' respective communities. Other successful lessons—unit prices and geography collages—were hands-on activities grounded in students' interests and daily lives.

After 12 months of working with MI theory, Betsy noted, "The recognition that my own strengths and expectations don't always match those of my students

feels much more like an exciting challenge now than a frightening problem" (Cornwell, in Kallenbach & Viens, 2001, p. 26). Two years after she concluded her AMI teacher research, Betsy describes her understanding of MI theory as an educational tool:

> We need to offer students alternatives, especially alternative media. Working in a variety of media will give learners the opportunity to process their knowledge using the full range of their intelligences and strengths. So, . . . if the old standby pencil-and-paper [isn't] taking us where we want to go, we need to think, is there another way to get there? When we incorporate building blocks, potato chips, board games, seeds and dirt, fabric, music, puzzles, drama, animal carcasses, tombstones, film, staircases, memories, medicines, bagels, photographs, crafts, meals, etc. into our lessons, we offer our learners the chance to build their own paths to learning. (Cornwell, e-mail correspondence, February 15, 2001)

Profile III Conclusion

Betsy's interpretation of MI theory led her to explore a connection between intelligence profiling and problem-solving. She did not find the causal relationship she had hoped would exist between the two. Most of her students did not care to talk about their intelligences, and sometimes such conversations were almost counterproductive to Betsy's aims. She also was unable to make much educational use of the information about how her students solved various problems related to daily life. Neither the profiling nor the problem-solving was well connected to how she designed and delivered her lessons. However, they led her to other more fruitful ways of interpreting MI theory and to doing what she had hoped: to match the curriculum with her students' gifts and thinking patterns.

Betsy's trajectory with MI theory demonstrates a gradual process of aligning her practice with the beliefs she stated early in her AMI involvement. Her candor in sharing her fears about looking stupid in front of her students gives us a glimpse of what can prevent a teacher from taking risks with her teaching. For Betsy, MI theory provided a useful framework that pushed her to recognize students' strengths and interests she had not previously noticed. It—and, no doubt, the influence of her AMI colleagues—gave her ideas about changing her lessons in light of new information. Over time, she made great strides in bridging the gap between her beliefs and teaching practices within the constraints of her teaching context.

PROFILE IV: MEG COSTANZO

Background

Meg Costanzo joined the AMI study after working as a middle school teacher for 23 years and as a reading tutor for adults for 3 years at the Tutorial Center in Manchester, Vermont. During the AMI Study, Meg taught an adult secondary level class in which students were studying either for the Vermont adult diploma or to pass the GED test. One of Meg's students had received his GED the previous semester and had returned to brush up on his math and writing skills before applying to college. At any one time, the class had three to six students. It met twice a week for a total of four hours. Meg wanted to focus her AMI work on developing MI-based teaching approaches to math and writing because these were her students' most challenging areas.

By her own account, Meg was used to teaching through different senses, using manipulatives to teach math, and doing talk-aloud protocols with her middle school students. However, she had shied away from using these kinds of nontraditional teaching techniques, fearing they would appear juvenile to her adult students. MI theory gave her license to try some of those techniques—most notably, project-based learning—with her adult students and increased her use of math manipulatives.

Definition of Intelligence as the Touchstone

The definition of intelligence served as Meg's touchstone for thinking about MI-based instruction and assessment. Meg reasoned that if intelligence consists of the ability to solve problems and fashion products, instruction should create opportunities for students to use their intelligence strengths to do that. Meg's research question flowed logically from her focus on the definition of intelligence: How can MI theory guide the development of project-based learning activities that are designed to address the needs and interests of ABE students?

Moreover, Meg engaged her students in thinking about what intelligence means to them. For example, she wrote the word intelligence on the board and asked students to say the first thing that came to mind. In that way, she drew out students' conceptions of intelligence and created an early opportunity for them to compare their views with MI theory.

Strong Emphasis on Students' Unique Intelligence Profile and Self-Reflection

Although the definition of intelligence guided Meg's AMI work, her understanding of MI theory was equally grounded in valuing each person's unique intelligence profiles and the self-reflection it can engender.

Meg relied on her strong intrapersonal intelligence to understand MI theory. She asserts that "my own understanding of MI came about through my experiences in applying the theory in practice and my attempts to understand my own intelligences as well as the intelligences of others whom I know well" (Costanzo, in Kallenbach & Viens, 2001, p. 31). She reflected on her childhood and the types of toys and activities she liked. She also analyzed how she learned a skill that was not her strength, i.e., skiing. She felt that relating MI theory to her own life was crucial to her understanding of the theory. Meg's self-reflection confirmed to her the value of having students reflect on their own intelligences.

Armstrong's book *Seven Kinds of Smart* (1993) and the March AMI institute with Branton Shearer inspired Meg to develop an AMI survey of her own to "encourage students to go through the same type of reflective process I had just experienced" (Costanzo, in Kallenbach & Viens, 2001, p. 32). She wrote in her journal that she "can't imagine not sharing information on MI with my students" (Costanzo, journal, January 1997).

Meg also developed other pathways to self-assessment, such as a writing assignment in which students were asked: If you had 24 hours to yourself to plan anything you wished, what would you do? She instituted dialogue journal writing as a regular part of every class to help her students reflect on their learning processes and preferences. She noted that students started staying longer after class to write their journals and continue discussions. This reinforced Meg's commitment to implementing self-reflection activities with her students.

Above all, Meg viewed self-reflection as a means for her students to develop more suitable learning strategies for themselves. After four months of encouraging and expecting her students to do this, she acknowledged that she was expecting students to make the leap to self-reflection too quickly and that this skill "needs more cultivation and guidance. . . . I have to provide numerous opportunities for students to analyze their problem-solving capabilities" (Costanzo, journal, April 1997). Rather than abandon her efforts, Meg redoubled them and changed her expectations about the students' pace of change regarding new learning strategies.

Surprisingly, despite her consistent emphasis on MI Reflections, Meg for the first nine months in the project considered the personal intelligences less important in the educational context than the other intelligences. She admits, "When I had first began studying MI theory, I had subconsciously dismissed interpersonal and intra-personal intelligences into a subcategory that was less significant than the other six intelligences. Upon reading Goleman's *Emotional Intelligence* book (1995) and rereading the chapter in *Frames of Mind* entitled "Personal Intelligences," I changed my attitude regarding these two intelligences" (Costanzo, in Kallenbach & Viens, 2001, p. 33). Meg began to view the personal intelligences as important components of her GED program. By the end of the AMI study 18 months later, Meg concluded, "I'm quicker to teach students self-assessment and monitoring of understanding. Right from the start, I get them involved in planning their own course of action in the classroom" (Costanzo, journal, January 1998).

Many Ways of Being Smart

Project-based learning was one means Meg used to interpret MI theory. It offered many possibilities for students to apply their many ways of being smart. Although indicated by her chosen research question, it was by no means the only or even the predominant way in which she designed lessons. She regularly applied MI theory to other types of lessons as well (See MI-Inspired Instruction, p. 58).

To determine the topic for her first project-based unit, Meg had her students complete an interest inventory. She also considered informal conversations with her students in selecting Vermont's changing nature as the topic reflecting student interest. She began the unit by asking students to list how Vermont had changed in their lifetime and to rate the changes based on how they felt about them: positive, negative, or neutral. As part of this project, students analyzed a political cartoon about development in Vermont; read articles; and listened to a guest speaker, a photographer Meg had invited as a way to encourage students to explore their intelligences. She had purchased a disposable camera and asked students how they might tie photography to Vermont's changing nature. She offered it to anyone who would like to take pictures of Vermont's changing nature.

At other times, Meg referred explicitly to multiple intelligences. For example, after asking students to solve a word puzzle, she asked which intelligences they had used to solve the puzzle. This activity was fun for the students and offered a nonthreatening way to open a discussion about MI. Meg found that the class discussions about MI and her willingness to respect and honor varied intelligences made students more receptive to nontraditional teaching approaches. In that sense, the MI reflection activities reinforced the success of MI-based lessons.

Throughout the learning projects, Meg strongly emphasized discrete academic skill development. But here as well she looked for ways MI theory could help improve her teaching. The small class size made it possible for Meg to focus on an individual student's needs. For example, she pondered how she could best use MI theory to teach a particular student to write better sentences.

The realities of irregular student attendance and only four hours of instruction per week caused Meg to revise her approach to project-based teaching. She began to favor more narrowly defined problems that could provide students the opportunity to practice new approaches and then be applied to a larger-scale project.

Profile IV Conclusion

Meg never questioned whether to develop and implement MI-based lessons. That was indicated by her teacher research question and her multi-faceted interpretation of MI theory. She used the major tenets of MI theory in her instruction: the definition of intelligence, the view of intelligence as pluralistic, and the understanding that each person has different ways of knowing and being intelligent.

Meg's emphasis on self-assessment and self-reflection was consistent with assessment practices she already used, such as portfolios and student–teacher conferences in which student progress and goals were discussed. On a more personal level, it fit her self-defined intrapersonal intelligence strength.

Although Meg entered the AMI Study with ample experience with teaching approaches consistent with MI theory, her work with MI theory caused her to expand and diversify her teaching repertoire further. At the end her teacher research, Meg felt MI had caused her to take risks with her teaching.

Teachers' Interpretation of MI Theory: Conclusion

The four profiles illustrate how each teacher's interpretation of MI theory was shaped by the type of class she was teaching; her teaching context; and also, we suspect, by her pre-existing teaching style and philosophy. They show the many possible paths teachers can take with MI theory.

Of the four teachers profiled, Meg and Betsy emphasized identifying students' intelligences, albeit using different techniques, whereas Diane and Martha were not drawn to this way of interpreting MI theory. Meg and Betsy also tapped into the definition of intelligence and its emphasis on problem-solving as a source of

teaching strategies. All four teachers eventually developed lessons that allowed students to use different intelligence strengths.

Of the four teachers, Martha, Meg, and Diane came into the AMI project with a pre-existing repertoire of nontraditional teaching strategies that were already in the spirit of MI theory, or which they subsequently adapted to be more MI-based. For Meg and Martha, MI theory gave theoretical license to experiment with learning activities they previously had thought might be too juvenile. Betsy, on the other hand, did not have their pedagogical background and took longer to take such risks with her teaching. These teachers' stories foreshadow the ways all AMI teachers diversified their teaching practices (see the MI-Inspired Instruction Findings section that follows).

MI-Inspired Instruction

Forms of MI-Inspired Instruction

We identified three different forms of MI-inspired instruction that the AMI teachers designed and implemented: projects, bridging, and entry/exit points. Based on their particular goals and understanding of MI theory, the AMI teachers implemented one or more of these forms of MI-based instruction.

Projects refer to lessons or curriculum units that emphasize authentic problems and activities tapping students' intelligences as they are in life outside the classroom. Projects emphasize the "real problems and products" highlighted in MI theory's definition of intelligence. Projects also draw heavily on the notion that intelligences work not in isolation but in combination, in that projects emphasize domains, real tasks, or professional roles (Goodrich et al., 1998).

Bridging involves personalizing instruction and curriculum by creating a "bridge" from one or more students' strengths to areas in which they are having difficulty. Bridging emphasizes MI theory's tenet that every individual possesses a unique profile of intelligences and particular areas of strength. With bridging, the teacher's task is to identify the student's strength and employ that area in activities in the student's trouble area.

Entry and Exit Points refer to activities that engage students in a particular subject area or content. The entry/exit point format draws on MI's conception of pluralistic intelligence by emphasizing multiple entry points (intelligences or domains) into the class material. Exit points are activities through which students demonstrate new knowledge or understanding. All the AMI teachers used intelligences as a loose guide to ensuring that a range of entry points was available.

MI-Inspired Instruction Increases the Authenticity of Learning Experiences

Researchers have concluded that learning is enhanced when instructional materials reflect the real world and students' current and prior experiences. (Fingeret, 1991; Purcell-Gates et al., 2000). Purcell-Gates (2000) found that using authentic, real-life literacy materials (such as schedules, menus, forms, business letters, and notices) increased students' use of literacy skills outside of the classroom and types of literacy tasks and materials. Thus, authentic materials and activities increased the transfer of learning in the instructional setting to students' lives outside of the classroom.

Authentic and real-life learning activities are learner-centered. Of all the lessons the AMI teachers documented, those most favored by students and noted by teachers for high student engagement had content reflecting student interests and realities. Lessons that offered an authentic audience and an opportunity for students to apply activities to make real-life improvements were seen as best of all. Studies have indicated that the motivation to learn increases when students feel that their learning activities are helping others (Schwartz et al., in Bransford et al., 2000; Pintrich & Schunk, 1996).

Meg Costanzo's students rated a project as their favorite unit. A project enlisted students to devise ways to increase their learning center's enrollment. They redesigned the center's recruitment flier and sign outside the building. They wrote a public service announcement, interviewed program graduates, and calculated attendance rates. Meg wrote:

> I did not even have to ask the students to turn in their assignments. Three students had their work out and ready to turn in before I even brought up the subject. . . . The students are taking their work on this project seriously. This underscores the value of assigning work that is authentic and meaningful to students. (Costanzo, journal, September 1997)

Wendy Quinones documented a teachable moment when she and her students accompanied a classmate to a trial concerning a sexual assault in which the classmate had been the victim. In class, students wrote about the trial, exercising their writing skills. Wendy observed that students "seeing themselves influence events as a group enabled each of them to see herself as an individual with the power to influence events" (Quinones, in Kallenbach & Viens, 2001, p. 188).

One of the many ways in which ESOL teacher Terri Coustan increased the authenticity of her beginning-level classes with predominantly Laotian Hmong people was through a gardening project. Knowing that most of her students had been

farmers, Terri developed a learning project that built on her students' naturalist abilities. The students constructed an indoor greenhouse and prepared seed trays. They also maintained outdoor garden plots. The ESOL class integrated gardening activities: planning gardens, choosing seeds, and discussing such topics as sharing the space.

Terri also implemented a Coming to America unit (Coustan, in Kallenbach & Viens, in press), a set of activities about Laotian Hmongs who, like her students, left Laos and arrived in the United States. The unit involved watching a video and resource material about a group of Laotian Hmongs who settled in Minnesota. Terri extended the Coming to America activities with other literacy activities, including having her students draw and write about their own immigration experiences, construct boats that replicated one form of travel they used, and write sequence sentences and study vocabulary words from the Coming to America unit. Although not an authentic project per se, Coming to America drew on the students' recent history. The experience of coming to America was real for these students.

Authenticity didn't emerge only in large-scale projects. Betsy Cornwell held up a bag of potato chips and invited students to ask questions about it. This entry point activity led the students to compare the costs and other features of potato chips (quantity, greasiness) and to calculate how far they would have to walk to burn off the calories of a particular bag of potato chips. These were questions students might have asked outside the classroom. Moreover, the math activities were calculations that students may very well have used in their daily lives. Betsy concluded that "many of the authentic tasks MI theory inspired me to try seemed to very effectively create a safe, playful learning environment" (Cornwell, in Kallenbach & Viens, 2001, p. 24).

MI-Inspired Instruction Helps Make Learning Meaningful or Relevant to Students

Using materials or real experiences from students' daily lives in literacy instruction is not always possible or desirable. For example, when students are preparing to pass the GED test, the content and skills that must be mastered are dictated not by real life but by the GED, a multiple-choice test covering such topics as social studies, history, science, and literature. The ABE and GED teachers in the AMI Study found MI theory was a useful framework for developing learning activities that helped students connect content from outside their experience, such as reading historical fiction or learning about the planets, to their own lives. In effect, MI practices served to make instruction learner-centered.

Martha Jean developed a set of entry/exit point activities to help her students learn about planets. Planets is a GED test topic, but it is hardly a pressing topic of concern to these homeless adults. Martha prepared a packet of readings from different sources and made other reference materials available. She also included practice GED questions. After reviewing the information, students worked on their understanding of the planets through a Choose 3 lesson. Like all of Martha's Choose 3 activities, the options were based on Martha's understanding of how various intelligences could be tapped for this content.

Figure 9 is an excerpt from Martha's transcriptions of her students' reflections following the planets Choose 3 activity (Jean, journal, November 1997). The excerpt illustrates how Martha's choice activities helped students find a way to relate to the content, a topic that was quite removed from their lives.

Figure 9: Martha Jean's students reflect on the planets Choose 3 activity

I asked, "Did any particular activity help you learn about the planets?"

Jane & Jean: "Making the aliens from different planets."
Jean: " 'Cause I got to see, I had to find out what life was like on the planet to be able to make it."
Ted: "Being able to do it mathematically."
Jane: "Having fun making the people."

I asked, "How did that help you learn?"

Jane: "I actually wanted to read for once in my life."
Terry: "The chart. I learned a little bit about the rings around the planets. Which way they go."
Mary: "Everyone's. All the different ones helped."

Then I asked how this experience compares to other learning or classroom experiences.

Jean: "Because if we're in another class, they would have just quickly briefed everything. They handed us stuff and say, 'Go for it.' They just run through things and say, 'Okay, you're going to be tested on Friday. Learn it all and be ready.' "
Mary: "They give you information to just learn on your own."
Jean: "We didn't get to ask questions."
Terry: "It's never hands-on. It's easier to learn if it's hands-on."
Ted: "And if you ever interrupt in a regular class, you get thrown out, and you won't learn nothing."

I asked if it was different or similar in any way.

Mary: "It's totally different. In school, in the classroom, teachers hand out all papers to all students and then ask you to look over the papers more while they talk and chalk on the chalkboard to explain the different planets, without you visually doing it yourself. A teacher would ask . . ."
Terry: "And you're just copying notes is basically what she's saying, you have no idea 'cause you're just paying attention to copying them down. I'd just copy and not know what the teacher is talking about. I'd be like . . ."

Student comments suggest that learning experiences became more meaningful to them when they were invited to select activities compatible with their intelligence strengths. Some comments highlight how the students were engaged by Martha's choice activities. What stands out in this exchange is that students made different choices and felt they learned because they had fun. They had fun because the activity was hands-on, unlike their prior school experiences. We believe that hands-on activities increase student engagement in a learning experience, particularly when these activities map onto different intelligences.

The strength of Martha's approach was that it gave her students fitting entry points into a topic that was otherwise irrelevant to them. Martha's approach was meaningful to students and still addressed topics and skills they had to cover to prepare for the GED. In the planets Choose 3, for example, one activity choice asked students to "compare yourself to the planets you think you are most like and most different from by writing a description or creating a poem." This particular choice integrated writing practice, understanding similes, knowing the key features of each planet, and understanding one's own qualities.

Wendy Quinones developed homework assignments and projects that bridged students' areas of strength and preference to class topics. Her students explored and demonstrated their new knowledge and understanding through activities and products developed using their preferred media, such as original songs, oral presentations, art work, essays, graphic organizers, diagrams, skits, and role plays. By building these bridges between students' strengths and the skills and content to be learned, Wendy helped her students engage in and learn the course material. Her students completed choice and strength-based homework assignments, and she saw a higher level of engagement in her choice activities. In one powerful activity, they viewed and discussed the movie *Educating Rita.* Wendy wrote:

> Our discussion of the movie was incredibly rich, in part because the film itself engaged people in a very direct way. As one of them said, this is their story; they could relate profoundly to Rita and the events in her life. But allowing them at the outset to choose their own approach through MI-informed questions invited some students to participate in the discussion in ways they otherwise seldom had. They offered wonderful insights and saw that others did not necessarily have the same ones—that everyone made genuine contributions to the discussion. For example, one normally quiet woman demonstrated a stunning spatial intelligence by citing detail after detail of color, clothing, jewelry—each one a significant commentary on the movie and on Rita's character. (Quinones, in Kallenbach & Viens, 2001, p. 194)

Another lesson sequence through which Wendy engaged her students involved a field trip to a restored textile factory in Lowell, Massachusetts, as part of

her women's history course. In this case, the field trip served as an entry point and preparation for a reading of *Lyddie*, a historical novel about a 19th century mill girl. Although the topic was not drawn from the students' lives, the field trip attempted to make the topic real and meaningful to the students. The activity invited the students to put themselves in the shoes of a mill girl while in that environment. Wendy used MI theory to structure the learning around the field trip. She asked her students to reflect and write in response to such questions as "What emotions did your experiences during the visit produce in you?" and "What parts of the body would feel the worst after a day in the mill?" These questions helped students relate on a personal level to this piece of history.

Like Wendy, Lezlie Rocka used MI theory to help students relate to a reading of historical fiction with little relevance to the students' daily lives. The students were asked to take on the role of a character in the book to understand it better. Lezlie used the MI framework to develop intelligence-based choices for students to process their understanding of what they had read and to extend it using their imagination and intelligence. After reading a chapter in *Meet Addy* (Porter, 1993), a book about a young slave girl who escapes with her mother to freedom, students followed up with an activity of their choice. Some of the choices in this exit point activity included: draw a picture that represents a scene in the chapter, act out one scene, map Addy's journey, or pick a song and add additional lyrics that would give inspiration on such a journey.

In her research report, Lezlie documents her observations of the positive effect this and other MI-based activities had on her students' reading comprehension and motivation. One of her students said about the experience:

> We've been reading about cultures and slavery. Generations really, times that I've never known before . . . that I'm learning now. You never think about it 'til you start reading about these true stories about people's lives, it's horrible. So you kind of get emotional when you're reading some of it. That's why I like to do the role plays. I always like to do the role play because I want to feel it a little bit. And I listen very carefully to it to see if I got it. (Viens, interview, December 1997)

Terri Coustan built upon her gardening project, described earlier, and extended it into related activities in a unit. Terri took pictures of the students building the indoor garden; for a literacy activity, students sequenced these photos and wrote about them. Terri also had students plan a model outdoor garden using words, pictures, styrofoam, and other materials. Students wrote about a day in the life of a farmer and compared this to their experiences as farmers in Laos. A vegetable *Wheel of Fortune* game helped students practice math skills and study vocabulary.

Betsy Cornwell's poignant experience with one student points to the potential benefits of making content meaningful or relevant to students. Diane had resisted completing the geography assignments required for the adult high school diploma. When Betsy began to bridge Diane's outside interests to her geography assignments, Diane's attitude changed. From Diane's self-assessment, Betsy learned that Diane had a keen interest in other people and certain celebrities known for their compassion for others, namely Princess Diana and Mother Teresa. Betsy responded by designing an assignment in which Diane would track the travels of these celebrities.

"When we added magazine pictures, colored stickers, glue, wallpaper, newspaper clippings, and a biography of Princess Diana, [Diane] found her own way to reach her goal," Betsy wrote (Cornwell, in Kallenbach & Viens, 2001, p. 21). Subsequently, after avoiding them for two years, Diane easily completed the required assignments for graduation and obtained her high school diploma. In Betsy's case, MI theory had motivated her to know her student better and to figure out how to use that information in instruction to facilitate learning.

Career counselor Jean Mantzaris used MI theory to individualize instruction in a career exploration course. She developed and implemented an activity she named Memory Lane, in which adult students shared and played with their favorite childhood games and toys. Afterward, they reflected on the experience and related it to their intelligences and possible future careers. Jean wrote:

> Two students shared childhood photos during the reflection activity. John shared a picture of his first Halloween. He commented on how much he enjoyed pretending and still does. Kimberly talked about taking things apart and putting them together, something she still enjoys today. Eric talked about a childhood among adults, and how being a clown in school got him in trouble. He thought broadcasting might be something to explore. At the end of class, John remarked that his childhood is something he does not often think about but maybe should, as his imagination could make anything out of nothing. (Mantzaris, in Kallenbach & Viens, 2001, p. 139)

The MI framework broadened both Jean's and her students' conception of career planning. Unlike the typically flat profiles resulting from the career decision-making system she had been using, she found that her students' MI self-assessments had definite peaks and valleys. A flat profile results when students do not express specific preferences or interests. Moreover, the students themselves commented that the MI assessment "carried more punch" (p. 139), which we take to mean it was more meaningful and useful to them.

Implementing MI Practices Reduces Teacher Directedness and Increases Student Control and Initiative

Based on 40 observations of ABE classes, Beder et al. (2001) found "virtually no evidence of substantive learner input into decisions about instruction" in spite of the teachers' professed goal to be learner-centered. Beder explains this seeming contradiction with an observation that the teachers were "decidedly learner-centered in their affective relationships with learners" and with a contention that both teachers and learners have been socialized to expect teacher-directedness. Based on a study by Mehan (1979), Beder defined teacher directedness as "choice elicitation," an instructional style in which the teachers elicit factual information from the students. Beder found no examples in his sample of choice elicitation in which students choose the one right answer among several alternative answers. The assumption is that choice reduces teacher directedness by giving more control to students.

Providing a greater variety of entry points or ways to engage in a topic or skill area is perhaps the most common MI-informed practice, resulting from the most generative of MI's tenets that there are a plurality of intelligences. Giving students intelligence-based choices among learning and assessment activities is a common way teachers apply MI theory in practice. These choices do not fit Beder's and Mehan's definition of choice elicitation, but because all MI-based choices were correct answers, it can be argued that the AMI teachers' MI-based choice activities provided students with a broader array of choices and, therefore, even greater control. When teachers give students choices in how they learn and demonstrate what they have learned, they effectively are giving some control to students.

Lesson formats that gave students choices that correspond loosely to the eight intelligences were popular among AMI teachers and their students. Martha Jean's Choose 3 activities gave students 7–10 activity options from which to choose to work in specific GED topic areas, from social studies to math to language arts. Figure 10 shows a GED choice lesson on angles that Martha Jean developed.

Figure 10: Martha Jean's GED Choice Lesson on Angles

Choose 3: Angles

1. In 2–5 minutes, list as many angles as you see (inside or outside).
   Make a graph showing each type you found. Which angle is most common? Why?
2. Using your arm and elbow make five angles.
   Draw those angles and write approximate measures for each.
   Are there any kinds of angles that can not be made with an elbow? Explain your answer.
3. Discuss with someone and write:
   What does someone mean when they say, "What's your angle?"
   If you were on an icy road and did a 360, what happened to you?
   Why do you think the shape L is called a right angle.
4. Using play dough and/or paper, show the angles 180, 135, 90, and 45.
5. Find or make five triangles. Measure each angle and find the total number of degrees in each triangle by adding up the sums of the three angles.
6. Draw, make with play dough, or paint a place you know, and mark measure the angles.
7. Write a poem, song, chant, or rap using some of the following words about angles:
   - figure formed by two lines, intersection, elbow, notch, cusp, ork, flare, obtuse, acute
   - point of view, perspective, viewpoint, outlook, slant, standpoint, position
   - purpose, intention, plan, aim, objective, approach, method

These choice-based activities were typically followed by work in GED workbooks. Martha and her colleagues developed other lessons that contained options so open-ended they had no right answer. For example, some lessons allowed students to choose to relate their own experiences, qualities, or opinions to the object of study, such as Martha's planets lesson or Terri's students' timeline of farmers' lives in Laos. To be sure, the majority of the choices had a correct answer that the teacher knew. However, the students still could control the entry point based on their interest.

It is possible that the act of validating students' strengths, interests, and preferences is an important first step that helps build the students' self-confidence and enables them to take control over their own learning and the curriculum. Furthermore, when students examine their strengths, they are likely to deepen their self-knowledge, giving them a firmer foundation from which to direct their learning. As they implemented MI based practices, the AMI teachers developed a keener

understanding and appreciation of their students' strengths. Lezlie Rocka's comment illustrates this point:

> Originally, I thought that I saw my students' strengths no matter what kinds of lessons I did. But after reviewing all my data, especially comparing that of last year to this year, I see that through choice of expression and projects, I am able to see a wider variety of strengths. And the students are able to see their own strengths and the strengths of each other. (Rocka, journal, December 1997)

MI-based lessons that focus on strengths or provide choices are likely to conflict with students' initial expectations of how learning should be structured. Adult literacy learners are not used to looking to themselves or each other for ideas and direction when given the opening. When Meg posed the following question to her GED class, "What can we do, as a class, to make the Tutorial Center a more comfortable environment in which to work and learn?" her students were initially baffled. They were amused when she told them it was their project, and they were to decide on the best courses of action. Apparently, no one had ever asked them such a question, at least not when expecting a serious answer. The students brainstormed about options and then decided to vote how to respond to Meg's question. With prodding from Meg, they took more control over the project.

The AMI teachers perceived a noticeable shift in the teacher-to-student power relations as a result of their MI-based practices. MI-based practices such choice activities helped to ease students into a shift in the balance of power. Over time, as students experienced diverse MI-based learning activities, they began taking more initiative and control over the content or direction of the activities. In effect, this shared decision-making made the classroom more learner-centered. The AMI teachers found themselves relinquishing some control by giving their students choices and respecting individual ways of learning and knowing. Reviewing her lesson plans from the two years prior to the AMI study, Terri Coustan discovered she had doubled the number of choices in learning activities she gave to her students in the course of her AMI involvement. She found that as students began to express preferences through choice-based activities, they also became more assertive in other ways, slightly shifting the balance of power in the classroom. (Coustan, in Kallenbach & Viens, 2001, p. 74). She wrote:

> My experience over the past few years had shown me that these students were reluctant to share their preferences with me. I had almost given up hope of ever being able to learn their preferences and had decided that this behavior was related to learners with limited English. Now, the students appeared to have reached a benchmark or milestone. . . . More students made choices. And those choices

> reflected both what the students liked and did not like about the activities I suggested. (Coustan, report, June 1998)

Likewise, Lezlie Rocka comments, "My class became more interactive and student-directed as I experimented with MI theory. Before this research project, I did most of the leading and dictated the order of the activities" (Rocka, in Kallenbach & Viens, 2001, p. 215). Sharing power with students was an unanticipated outcome of the changes Terri and Lezlie made in their teaching.

Wendy Quinones explored how MI theory might serve to empower her students. She wrote:

> A change in the teacher–student relationship in the classroom rapidly became apparent. The combination of assignments based on multiple intelligences with the strategy of allowing students to choose their own assignments was the best I have yet found for sharing power while giving students a firm structure within which to work." (Quinones, in Kallenbach & Viens, 2001, p. 190)

Even when the MI-based activity did not entail choices but encouraged group work, students began to look to each other as sources of knowledge and ideas. Given encouragement from the teacher and challenging learning projects, they looked less to the teacher for information and direction at every step and more to each other. Jean Mantzaris did not use a Choose 3 format, but in her Memory Lane activity and Jobopoly game, she allowed for different entry points that touched upon several intelligences. Jean wrote:

> Once I started to diversify my lesson plans, I began to look to the students for more input. As time went on, students took over decision-making for activities such as the career board game. For example, they wrote all the Chance cards for the game. Their ideas were quite different from mine in that they focused more on the kinds of assistance they would need, whereas I would have included some luxury items such as a trip to a warm island, new car, jewelry, etc. They added two new squares: on-the-job training and Ph.D. programs. They developed the MI show for teachers on their own. I became a guide and participant in these activities designed by the students. As Julie [a student] commented, "It was a lot of fun and showed how much fun a bunch of people could accomplish if they got together." (Mantzaris, in Kallenbach & Viens, 2001, p. 142)

MI theory's emphasis on learner-centeredness led Meg Costanzo to assume that she needed to turn almost all control over to students. She wrote in her journal, "I've got to turn over more control to my students" (Costanzo, journal, February 1997). However, Meg's goal of making her class more student-driven presented challenges. Meg explained her quandary: "I truly feel that without some guidance and direction on my part, the class would suffer. Yet I also recognize the desirability

of having students be in charge of the projects. I feel as though I am on a seesaw, teetering back and forth on this issue" (ibid.).

One way Meg resolved her quandary about the appropriate degree of student control in her class was by introducing more open-ended math problems. Much to her surprise, she found students liked experimenting with challenging problems that did not have an obvious or a single answer. Another way was to give students MI-based choices in learning activities. Six months into the AMI study, Meg introduced a choice activity on drug abuse, a topic a student introduced. Later, she developed two more choice activities, one on student recruitment and the other on autobiography.

These and other MI-informed learning activities caused Meg to reassess her relationship to her students and, therefore, to her teaching.

> Because of my involvement in the AMI Project, I have come to recognize a new dynamic that emerged in my class. I come away from my research with a revised model for an effective ABE classroom, one that is less teacher-centered and which gives the students a greater voice in what they study. It is a classroom that emphasizes personal growth as well as academic development. It is a model that encourages students to solve real-life problems and develop a variety of skills they will find useful in the future. (Costanzo, in Kallenbach, Viens, 2001, p. 57)

MI-Inspired Instruction Conclusion

The findings suggest that the AMI teachers' MI efforts paid off with high levels of student engagement. During the year of the AMI Study (1997), Meg Costanzo's class attendance increased 220 percent over the previous year (Costanzo, in Kallenbach & Viens, 2001, p. 54). Likewise, Martha Jean calculated significantly higher rates of attendance and retention of LD/ADD students in her MI-informed class than in a comparison class in which she did not implement MI-informed activities. Diane Paxton won over overtly skeptical students with her MI-inspired activities.

Among the AMI Study's MI-inspired instructional practices, projects resulted in the highest levels of authentic instruction. Even if the projects were of limited scope, such as the potato chip lesson, they related directly to students' experiences. MI theory made even topics that were not grounded in students' lives more meaningful and relevant, as in the case of several bridging and entry/exit point activities. In those instances, students found meaning and relevance in activities they could approach from their preferred and strongest intelligences.

Three ideas figure prominently in our findings related to MI-Inspired Instruction: choice, learner-centeredness, and enjoyment. Choice-based activities, prominent in the AMI settings, were instrumental in increasing the relevance and meaningfulness of lessons and in reducing teacher directedness. Choices allowed students to identify, use, and demonstrate their particular areas of strength. This gave learners more confidence to take more control over their own learning, and it pushed teachers to allow that to happen.

Learner-centeredness runs through all three findings related to MI-Inspired Instruction (MI-Inspired Instruction increases the authenticity of learning experiences, makes learning more relevant and meaningful to students, and increases student control and initiative). It refers to efforts that teachers make to bridge their students' interests, abilities, and needs to classroom activities and to the learning objectives.

Finally, the teachers and students repeatedly noted the concept of enjoyment—of having fun—in connection with MI-inspired learning activities. Although authentic, relevant, or meaningful activities are not necessarily fun, AMI students and teachers consistently reported as enjoyable those activities we later identified as authentic or meaningful to students. If students report having fun with a learning experience, we assume that they were, at minimum, on task and adequately engaged—certain prerequisites for learning.

Multiple Intelligences Reflections

Forms of MI Reflections

MI Reflections is the term we coined to refer to approaches and activities through which students learned about MI theory and that used MI theory explicitly. Our analysis yielded three forms of MI Reflections the AMI teachers adopted: Learning About MI, Learning about Ourselves, and Learning About How We Learn. Each of these categories is descriptive of the primary goal for the associated activities, including: to introduce students to the theory as a rationale for new MI-based content (Learning About MI), to identify students' intelligence strengths through self-reflection activities (Learning About Ourselves), and/or to identify appropriate learning preferences and strategies for the students for use in their classrooms (Learning About How We Learn).

To implement MI Reflections, the AMI teachers designed activities that introduced the concept of multiple intelligences and trained the MI lens on students. Their goals were to get to know their students' strengths and to have students

identify and acknowledge their own and each other's intelligence strengths. Each AMI teacher came to her particular version of MI Reflections based on different learning objectives, contexts, and student populations. Our findings regarding MI Reflections focus on how the teachers chose to introduce MI theory to their students and on the variables that affected their choices in this regard. Those variables were discussed earlier (see Key Factors in AMI Teachers' Interpretations of MI Theory, p. 31).

Learning About MI approaches served the purpose of reassuring, and sometimes convincing, students that the MI-informed learning activities were not juvenile or dumbed-down material. Implementing MI-informed practices characteristically means implementing activities unfamiliar to most adult learners. The more unfamiliar the new activities were to students, the more important it was for teachers to provide a rationale to students for their inclusion. MI theory provided teachers with an explanation for MI practices based in research and originating from respected sources. It explained the connection between the MI-inspired activities and students' learning goals.

Learning About Ourselves approaches were driven by the assumption that students' self-concept, self-efficacy, and self-esteem could be positively affected by giving students opportunities to identify, articulate, reflect on, share, and/or demonstrate their abilities. These approaches were especially intended for those students who, equating intelligence with book learning, saw themselves as unintelligent. Because the teachers believed that students' own sense of self-efficacy played a large role in success or failure in the classroom, they identified in MI theory a tool for challenging their students' low self-regard with evidence to the contrary. The efforts of the AMI teachers demonstrated that MI-based formats, such as self-report surveys, group reflection activities and games, and the use of photo and dialogue journals, can provide powerful platforms for self-discovery and reversal of negative attitudes.

Learning About How We Learn activities utilized MI theory as a tool to identify students' learning preferences and areas of strength, with the intention of using this information to develop individualized learning strategies for students. Several AMI teachers found ways to help students translate their intelligence strengths into corresponding learning strategies. Based on the teacher's and student's understanding of that student's strengths, the teacher might incorporate more graphic representations and materials, include movement activities, or more directly apply the student's strength area—a carpenter's measuring abilities, for example—to a unit or lesson. Student–teacher communication, such as dialogue and photo journals (with photos of students at work in the classroom), in combination with the teachers'

persistent prompting, proved key to the students beginning to connect the information about their intelligences with new learning strategies.

MI as Content (Learning About MI) Can Help Resistant Students

It is the rare adult educator who has not experienced students hesitating, if not outright resisting, a nontraditional lesson or unit. Perhaps because of its hands-on nature, role play, music, drawing, or movement strikes some students as juvenile and not appropriate for adult learning. Moreover, these sorts of learning activities do not match many students' notions of appropriate ESOL, ABE, or GED activities. Most likely based on their previous school experiences, students understand appropriate classroom activities in ways that reflect the more traditional, paper and pencil–based approaches.

The more traditional approaches may be a good fit with some students' learning preferences. For many others, however, the preference for workbooks and other passive learning methods is an unexamined assumption based on a lack of exposure to other ways of learning. Furthermore, based on their negative learning experiences in academic settings, some students incorrectly assume that learning cannot be enjoyable or fun—no pain, no gain. If a learning activity is fun, it is automatically suspect. The AMI experience suggests that adult educators interested in introducing MI-based lessons need to anticipate and plan for these responses. Many AMI students who were initially hesitant or, in some cases, quite negative toward MI-informed activities came to embrace them relatively quickly. The AMI experience demonstrates that an explicit introduction to MI theory and its relationship to unfamiliar, nontraditional activities can work to overcome students' bias against these new learning experiences.

An added potential benefit of having conversations about intelligence with students is countering any unhelpful, even detrimental, concepts of intelligence they may hold. Bransford et al. (2000) state:

> Students' theories of what it means to be intelligent can affect their performance. Research shows that students who think that intelligence is a fixed entity are more likely to be performance-oriented than learning-oriented—they want to look good rather than risk making mistakes while learning. These students are especially likely to bail out when tasks become difficult. In contrast, students who think that intelligence is malleable are more willing to struggle with challenging tasks; they are more comfortable with risk. (p. 23)

Conversations about multiple intelligences or the concept of intelligence are not typically a part of the ABE, ESOL or GED curriculum. As there are few

resources for teaching about intelligence, AMI teachers who chose to go down this path had to create their own lessons. They created presentations, handouts, and hands-on activities, and paused to identify intelligences students were using during classroom activities. These activities introduced students to MI theory's major tenets. In a few instances, they also engaged students in debating the concept of intelligence. Two teachers (Mantzaris and Marlowe) had their students create presentations introducing MI theory to others.

Diane Marlowe's MI introductory activity included talking to students about MI theory and asking them to name famous people with strengths in particular intelligences. She also led them through the Working from Strengths and Weaknesses activity (Baum, in Kallenbach & Viens, in press) in which students choose to demonstrate understanding of a topic first using their least preferred way of expressing themselves, followed by the most preferred. In each case, participants choose between writers, builders, artists, and actors. She then enlisted her students in teaching students new to the program about MI:

> Now that the original group of students had been introduced to MI, their assignment was to teach incoming students what they had learned. . . . At first, there was resistance to this idea. We discussed it, and it seemed students were worried that they might have to replicate my presentation. I spent a whole class with them reassuring them they did NOT have to do that, and we brainstormed how to split the assignment up so that each student would have a specific intelligence to present to the class—we worked in groups of three. One student videotaped an aerobics class to demonstrate [bodily] kinesthetic intelligence! Then, still in groups, students presented the Problem-Solving in the MI Classroom activities as a way to involve the new students directly in the process. They felt that this hands-on activity was effective and so wanted to use it with the others. (Marlowe, report, June 1997)

These presentations about MI theory paved the way for an unconventional, multi-unit learning project that centered on quilting and integrated geometry, reading, and writing. Diane documents a high level of engagement and enthusiasm in this unit by both male and female students, despite the men's initial resistance to quilting. We believe that the ways Diane involved her students in thinking about and taking ownership of MI theory was a key factor in the students' positive reaction to the geometry and quilting unit.

Martha Jean discussed MI theory with her students to present a rationale for her nontraditional learning activities. She wanted them to understand why and how the classroom activities were changing. She wanted her students to buy into MI-informed approaches, to believe that the new ways of learning were in their best interest. Martha's data show that her students perceived the MI-based lessons that

followed to be fun and of high educational value, and in stark contrast with their previous experiences in K–12 settings (Jean, in Kallenbach & Viens, 2001, p. 113).

For the two AMI ESOL teachers, teaching about MI theory was neither straightforward nor an unmitigated success. Terri Coustan's beginning ESOL students were primarily Laotians who were not literate in their native language, Hmong. She and her students did not share a language in which to discuss MI theory. Terri met this challenge by developing visual and hands-on activities about MI theory. Although some students were able to choose photographs that to them depicted different intelligences (e.g., a shaman for interpersonal intelligence), Terri was not sure to what degree her students understood MI theory's central ideas and their relevance to learning English. Overall, MI theory was not a topic of high interest to most of Terri's students.

ESOL teacher Diane Paxton developed a presentation with photos representing each intelligence. She asked her elderly Latino students if they thought they were strong or weak in each intelligence, and to give examples. The students talked about their interests and hobbies, but they were quickly bored with the topic. Diane concluded that her students did not find MI theory relevant to learning English. She also speculated that her students did not have sufficient metacognitive experience with self-reflection related to learning, given their limited educational background. Like Terri's students, their interest—even their memory of having studied MI theory—waned quickly. Diane concluded, "As I look back, I see that talking about MI is not as important as just doing MI, especially with this group of students" (Paxton, report, June, 1998).

Even without a language barrier, all students did not necessarily view intelligence as an important topic to take up class time. They did not see value in thinking and talking about intelligences. Others had their own complex conceptions of intelligence. One well-documented case is Betsy Cornwell's student Diane, for whom MI was "a lot of big words I don't understand" (Cornwell, report, June 1998). Even after Betsy simplified the MI language from linguistic intelligence to word smart, from bodily-kinesthetic intelligence to body smart, and so on, she felt this had little effect on her students' attitudes toward MI theory. With Diane, in particular, the issue was not simply the vocabulary but her concept of what it means to be smart: "'cause if they was a smart learner, they would not be asking for help. You'd already know all the answers. If they were smart, they would not need school, and they would not need teachers" (Cornwell, in Kallenbach & Viens, 2001, p. 20). Betsy's next step was to try to examine with Diane how she viewed smart people and, by extension, herself. As long as Diane felt smart people never asked for help or needed teachers, she could not possibly feel smart in any intelligence while being a student.

As these AMI experiences illustrate, lessons about MI resonated with some learner groups and not with others. Students can perceive MI theory as extraneous, confusing, or irrelevant to their learning goals. Teachers like Diane Paxton found success with MI-informed activities and reflections about the lesson without connecting them explicitly to MI theory. All but one of the AMI secondary-level teachers and the one career counselor, on the other hand, found talking about MI theory useful for increasing students' acceptance and appreciation of nontraditional activities. The talk about MI theory provided a rationale for MI-inspired lessons. Ultimately, of course, the success of the nontraditional learning activity that followed had as much to do with the lesson itself: how engaging and relevant it felt to students.

MI Reflections (Learning About Ourselves) Enhance Students' Perceptions of Their Abilities and Their Career Aspirations

Nine AMI teachers developed and adapted one or more MI self-reflection activities that fit their goals and contexts. They saw the potential of MI self-reflection to help students recognize their strengths and, for perhaps the first time ever, to realize that they are intelligent and able individuals. They wanted to use MI theory to help students feel positive about their abilities, recognizing that "of the various self-perceived causes of achievement, ability is seen as the most significant influence on academic performance" (Covington, 1989, p. 86). Hansford and Hattie (1982) found an average correlation of .42 between measures of achievement and self-perception of ability scales (compared to a correlation of .16 between other measures of self and achievement). Covington and Omelich (1979) found that self-perception of ability was linked to emotions, which was linked to actual test performance, showing the relationship between a student's perception of her own ability and effects on test performance. Covington notes, "Those students who ascribed an earlier failure to lack of ability experienced shame, which in turn inhibited subsequent performance." Brown and Weiner (1984) and Covington and Omelich (1984) both found that ability is the most significant contributor to feelings of self-regard among students.

Understanding the link between students' perceptions of their abilities and their actual academic performance, several AMI teachers set out to create opportunities for students to recognize and experience their abilities as defined and described by MI theory. The AMI teachers' primary goal for Learning About Ourselves was that their students believe and own their unique profile of abilities and their particular areas of strength.

For Meg Costanzo, students learning about themselves was a primary goal and an ongoing process. She developed an informal self-assessment that several

other AMI teachers adopted, in some cases with revisions based on their teaching context. In addition to the self-assessment, Meg implemented several activities designed to draw out her students' strengths, such as constructing individual autobiography cubes, facilitating group discussions, and prompted essay writing (If you had 24 hours to yourself to plan anything you wished, what would you do?). A comment by one of her GED students illustrates what is probably a common frame of mind among adult learners:

> I haven't really had time to think about where my strengths are. I just know my weaknesses, and that sometimes worries me. I always knew everyone had strengths and weaknesses, but I always worried about the things I couldn't do and not the things I could. (Costanzo, in Kallenbach & Viens, 2000, p. 58)

A month later, after participating in various MI self-reflection activities and MI-inspired lessons, the same student wrote in her journal, "I never thought I could feel this good about my education and my self-esteem" (ibid., p. 59).

Almost every AMI teacher documented similar student comments about more positive feelings toward their abilities and themselves as learners. Our data suggest that MI Reflections prompted these adult learners to see themselves as learners in a more positive light after identifying and reflecting on their own abilities. This was particularly the case when they were able to apply their abilities to successful learning strategies in the classroom. Perhaps in those cases, seeing was believing.

MI Reflections activities became central to the career exploration course Jean Mantzaris taught to GED students. Jean wanted her students to find a better fit between their intelligence strengths and the careers they wished to pursue. In her experience, adult learners often made career decisions with little self-reflection or understanding of their abilities. The goal of the course was to create opportunities for students to explore and choose jobs or career paths that matched their interests and intelligence strengths, and were achievable given students' financial situations, family obligations, and academic achievement. Based on what they had learned about MI theory, Jean's students created an interactive presentation about MI to other teachers at Jean's learning center (Wallingford Adult Education, Wallingford, Connecticut), to their own and the teachers' delight. Jean documented greatly increased learner engagement in highly nontraditional learning activities. For example, her Memory Lane activity engaged students in playing with their favorite childhood toys and games and subsequently examining the intelligence strengths involved, and how those intelligences were reflected in their career goals.

After participating in each MI-inspired activity, students were asked to write their reflections in journals. Students commented not only on how much they

enjoyed the activity, but also on their appreciation of their own and other people's abilities. In that sense, they took away more from the course than Jean had anticipated:

> Steve: "This stuff is fun, but more than that, it shows you how many people around you are smart in many ways, and so am I."
> Eric: "Like, it woke me up. I thought it was enlightening. I came in with a poor mood, but this picked up my spirits."
> Julie: "It shows how all the intelligences are everywhere in the world today, and when we appreciate them, we can get along and accomplish a lot." (Mantzaris, in Kallenbach & Viens, 2000, p. 140)

Over the 12-week course, MI self-reflection activities had a powerful impact on some students' career plans. Jean found that the three students who had participated minimally in the course did not change their career plans, but the eight others broadened their choices and began to consider more alternatives.

Although career planning was not the focus of Meg Costanzo's GED class, three of her six students connected their MI self-reflections to possible career paths.

> The survey actually helped me think about what I wanted to do. When I originally did my high school (alternative) diploma, I had no idea what I wanted to do, or that I was good at working with people. Now I'm thinking of going into social work. (excerpt from student journal, in Costanzo, journal, October 1997)

Other students linked MI theory to their children. They began to see MI theory's potential to change the way their children were being educated. Bonnie Fortini's students related the message of MI theory not to their own childhoods, but to what they hoped for their children. One father-to-be said he would use his knowledge of MI to make sure no one ever made his child feel stupid, the way he had felt in school. Two of his classmates wrote that they were more willing to try to learn after learning about MI theory. One woman said that by learning about MI, she learned that it was okay to be different and that MI was a different way to look at herself (Kallenbach, class observation, December 8, 1997).

Wendy Quinones hoped that by seeing and sharing a movie through their preferred MI lens, her students would not only deepen their understanding of the film, they would also have the opportunity to see and acknowledge their own strengths, as well as those of their peers. Wendy described the film discussion as a magnificent early step into MI reflections. Like Jean Mantzaris, Wendy documented several instances when her students not only increased their awareness of their own strengths, but also came to recognize and appreciate more their classmates' strengths.

Wendy's research resulted in a finding that the "use of the MI framework provided students with tangible evidence both that others have strengths which they lack and that they themselves have strengths—perhaps never before acknowledged or valued—which others lack" (Quinones, in Kallenbach & Viens, 2001, p. 193). One of Wendy's students expressed it thus:

> I have learned different ways that I am smart. My creativity has grown, and I have a lot more confidence in myself. As time goes by, I'm realizing more and more that I am somebody, not just a dummy who dropped out of high school, got pregnant, and ended up on welfare. (ibid., p. 187)

Yet not all students wanted to reflect on their strengths and interests. Indeed, Wendy Quinones' overwhelmingly well-received MI self-reflection activities, which resulted in very powerful recognition of the intelligences that individuals brought to the group, fell flat the following year. Wendy attributed this to a very different student group. Although the instructional context was almost the same, the students were not. The second group was much younger, with perhaps less maturity and life experience than the previous year's students. This group did not understand or appreciate the relevance of self-reflection to their learning.

In Terri Coustan's and Diane Paxton's ESOL classrooms, linguistic as well as cultural differences affected students' receptiveness to self-assessment. Terri considered the Hmong people's reluctance to extol their strengths as a primary contributor to the students' lack of engagement in self-reflection activities. Diane felt the whole business of assessing intelligences was problematic:

> I would venture to say that every adult student has stories of the development or estrangement of their intelligences which are at least as complex and difficult to untangle as mine. For me, this is really starting to call into question the part of MI that stresses that individuals investigate and become familiar with their own intelligence profiles. This is a complex process that depends on many things. Given the usual context of the 4–5 hour a week adult education class, well, it's a tall order to think that teachers and students can put enough emphasis on seeking these profiles to arrive at something which might be accurate enough to be applied helpfully in other areas of life and learning. (Paxton, journal, April 1997)

As in the case of learning about MI theory, MI self-assessments did not reach students in the two beginning-level ESOL classrooms. By and large, they proved more frustrating than productive to the beginning-level ESOL students and their teachers. We do not know how more advanced ESOL students would have responded.

Not all the ABE or GED students saw the relevance of self-reflection to their goals or to learning in general. Some students' objections and unwillingness to engage in MI self-reflection seemed to come more from unfamiliarity and lack of experience with metacognitive practices—that is, thinking about their learning. It wasn't necessarily that they came in with a firm position against MI Reflections but rather, this was new to them. The data indicate that students shifted their paradigm based on the teacher's persistence in helping them develop the necessary meta-cognitive skills. The effectiveness of the teachers' persistence was, of course, dependent on the students' persistence in attending classes so that they were exposed not only to self-reflection, but also to lessons that invited students to use their many intelligences.

MI Reflections Are Useful For Identifying Learning Strategies for Students

Research suggests that those who know themselves as learners and are able to monitor and change their learning strategies accordingly are better able to transfer their learning to new contexts (Bransford et al., 2000). Further, the teaching of metacognitive skills should be integrated into the curriculum in different subjects rather than taught as a separate set of skills. In the AMI Study, MI theory served as a tool for developing the learners' metacognitive abilities. In virtually every class, this was a challenging undertaking that required the teacher's skill and persistence.

For the majority of AMI teachers, MI self-reflection with students was an important preliminary step to identifying learning strategies. Four of the 10 teachers (Costanzo, Cornwell, Coustan, and Marlowe) helped their students develop learning strategies based on what they could observe about the students' intelligence strengths. Diane Paxton also worked actively to help her students identify their learning preferences; however, she did not link these reflections to MI theory. Yet it would be misleading to suggest that translating information about a student's intelligence strengths into learning strategies for literacy or numeracy is straight-forward or easy. In taking on this task, the AMI teachers ventured into a territory with few guideposts.

As Meg Costanzo put it, "Once a student's strongest intelligences have been identified, the teacher must design an educational environment that will encourage the students to draw upon these capabilities" (Costanzo, journal, December 1997). Meg emphasized ongoing, regular communication with her students through dialogue journals in which she would often pose such questions as: "How do you think your spatial abilities and your ability to work with your hands can help you solve this math problem?" and "What essay topic would be engaging for you?" The dialogue journals became an important vehicle through which Meg and her students

reflected on the students' learning preferences. Talk about the students' intelligences figured prominently in these journals. The journals became a regular part of the classroom culture. The last 15 minutes of each two-hour session was reserved for journal writing. Meg reported that this practice took hold quickly, and soon she did not have to prompt students to write in their journals. Often, students would stay past the class end time of 8:30 PM to continue writing in their journals. Given that Meg's students were adults who held daytime jobs and were parenting children, we can only conclude that they found the reflection process helpful or at least gratifying.

Perhaps her small class size (six students) and small course load (one course), coupled with 23 years of teaching experience, allowed Meg to pay constant and meticulous attention to her students' learning strategies and document the process. Meg acknowledged that it took a lot of prompting on her part before most of the students could make the leap from knowing their intelligence strengths to applying this information to a learning task. For example, she found that visual cues and drawing are sometimes helpful for students with spatial strengths. She wrote:

> I ask them to draw upon their strongest intelligences when confronting academic difficulties. In one case, I encouraged a student who was having trouble in math to use her linguistic, musical and spatial skills to help her work in fractions. I suggested to another student that he use his construction skills to help him better understand how to build a paragraph. (Costanzo, journal, December 1997)

Meg documented how she went about helping three students reflect on their learning preferences and how they gradually benefited from it. One of these students, Jennifer, expressed how she understood MI theory's applicability to her studies: "I realize I learn faster by visual. I like working by myself. I am very easily distracted" (Costanzo, in Kallenbach & Viens, 2001, p. 49). Another student, Roland, began with a healthy dose of skepticism about what MI theory had to offer him. Early in the program, Roland commented, "What good is being intelligent [spatially]? I might as well stick to woodworking" (ibid., p. 39). Meg wrote about his process of relating to MI theory:

> Roland's acceptance of his strongest intelligence and his willingness to apply it to the writing process developed over the course of the semester. In January, he could not "find himself" in the descriptions of any of the intelligences. By May, he was claiming his intelligence without my prompting, but still not drawing upon it voluntarily when faced with the challenge of a writing assignment. . . . By June, Roland had recognized that a web was an effective way for him to gather his ideas before attempting to write an essay." (ibid., p. 38)

Diane Marlowe incorporated reflection questions at the end of each segment in her geometry and quilting unit. For example, after the lessons on tangrams, she asked students to reflect on how they approached the problem-solving—individually or in a group—and why. She asked students to write down the steps they used in problem-solving for the tangram math activity, including any mistakes they made and how they solved them. She challenged students to reflect on how they best solve math problems.

Given the constraints on communication between Terri Coustan and her students, she opted to take pictures of her students while they worked on different activities in the classroom. She then inserted these photographs into student journals with prompts, such as "What are you doing, and do you want to do it again?" Terri found that her students responded positively to photographs and other visual prompts, so she based her MI reflection activities around them.

Terri's reflection questions did not reference MI theory, but they gave her information that she could map onto her detailed observations about her students' intelligence strengths. Terri observed a pattern: Her students kept making the same choices in ESOL activities even though they could not explain these choices in English. Terri's pre- and post-surveys of her students' learning preferences showed that they had developed a greater appreciation for a wider range of possible ways to learn English. These strategies included both traditional ones, such as writing on the blackboard, copying, and reading, as well as nontraditional ones, such as constructing and describing objects with play dough or other materials. Significantly, in the post-test, 93 percent of the students stated that making things from play dough helped in learning English, whereas only 44 percent thought so in the pre-test (Coustan, in Kallenbach & Viens, 2001, p. 71).

Work with MI theory led ESOL teacher Diane Paxton to engage her students in ongoing reflections about what they did or didn't like about the lessons and which activities they considered the most beneficial to learning English. In one class, several students resisted even the reflection process because they were not used to it and did not see its value. However, Diane concluded that the reflection process itself proved an important factor in gradually decreasing students' resistance to nontraditional learning activities. She wrote, "Participation in oral assessments exposed students to a rich diversity of opinions about effective ways to learn and about what is beneficial for an ESOL student" (Paxton, in Kallenbach & Viens, 2001, p. 164). She also found that building trust and a safe learning environment over time also contributed to the paradigm shift (p. 169).

MI Reflections Conclusion

The AMI Study affirmed the value of student self-reflection for building self-confidence and learning-to-learn skills. However, our experience also strongly suggests that developing adult literacy learners' associated metacognitive skills—learning to think about and assess one's learning processes and preferences—takes active work on the part of both teachers and students. AMI teachers learned that getting adult literacy students to reflect on their strengths and to see the reflection's relevance to learning required teachers and students to persist despite resistance and to regularly engage in such reflection. We also learned that having a grasp of students' general metacognitive abilities and their understanding of learning-to-learn skills can help teachers design MI Reflections experiences that are appropriate for their students and that avoid or overcome student resistance.

Nine of 10 AMI teachers implemented some form of MI Reflections, such as introducing the theory, uncovering and celebrating students' strengths, exploring careers, or identifying effective learning strategies with students. Six teachers ultimately positioned MI Reflections as a significant part of their teaching practice. The range of the AMI teachers' experiences and the differences and similarities among them tell us two things. First, it is important to connect explicitly for students the purposes of MI Reflections activities to broader learning goals. In other words, both teacher and students need to understand how and why MI theory is relevant to their particular learning context.

At the same time, our experience also suggests that no matter how careful the planning or how relevant and wonderful the activities, we often cannot predict what will work with a particular group of students. Although there were indications that more educated AMI students reacted more positively to MI reflection activities, there were exceptions. We have learned that keeping a proverbial ear to the ground to gauge and invite student responses leads to MI reflection practices that are most fitting for a particular context and best understood and most appreciated by students.

CHAPTER 4: IMPLICATIONS FOR PRACTICE, POLICY, AND RESEARCH

Practice

An Adult MI Frame. This report is in itself an exhaustive description of the implications of MI theory for adult literacy practice. The AMI Study participants have joined a group of educators (pre-K through adults) who have considered the implications of MI theory for practice for a particular context or level. In this case, the AMI teachers led the way in uncovering MI applications fitting adult literacy education.

The term MI Frames describes frameworks or tools used to help identify and choose an appropriate use of MI theory for the goals, context, and extant realities in each setting (Baum et al., in press). MI Frames include Gardner's Entry Point Approach (1999, p. 188); Baum, Viens, and Slatin's Pathways model (in press), which includes the Explorations, Building on Strengths, Understanding, Authentic Problems, and Talent Development Pathways; and Project SUMIT's Compass Points (http://pzweb.harvard.edu/SUMIT/Default.htm). Each of these frames helps educators use MI theory for curriculum, instruction, and assessment in ways that fit their goals and contexts. Through the AMI Study, we articulated and coined an MI Frame for adult literacy education: MI-Inspired Instruction and MI Reflections.

MI Reflections and MI-Inspired Instruction describe the two primary goals teachers addressed with their collection of MI-based activities. The AMI teacher researchers devised the MI Frame suitable to the goals and realities of adult literacy education. They used MI Reflections to shore up the low perception of self that many adult literacy students hold. They developed MI-inspired instructional approaches to engage students in learning the material they needed to pass the GED exam, to learn the basic literacies, or learn to speak English.

The implications of the AMI Study for adult literacy education are that adult literacy instructors no longer have to reinvent the wheel with MI theory. The MI applications that evolved through the AMI Study illustrate how MI theory can be used well and substantively in adult literacy education. There is now a foundation of MI practice in adult literacy that can serve other practitioners in the field of adult literacy.

Teacher Readiness. For individual teachers to use MI theory successfully to plan instruction and assessment, they need to possess certain knowledge and skills,

including an understanding of the theory and access to and willingness to implement a diverse body of learning activities. Teachers need to understand that MI theory is not a technique but a framework that validates and extends many good teaching practices; however, it may also require more work on their part. Planning a curriculum that offers students multiple pathways to learning a particular skill, concept, or subject is a skill in its own right. To implement such a curriculum may require risk-taking beyond a teacher's comfort zone. At the beginning literacy levels, it also requires the educator's time and perseverance to help develop students' meta-cognitive skills. At the same time, teachers need to anticipate that not all students necessarily embrace MI-inspired lessons or reflections as worthwhile learning activities. Most students lack the familiarity with such ways of teaching and learning.

To be prepared for MI implementation, teachers also need to be open to their students' abilities and potential. They need to be willing to get to know their students in a more holistic way, as adults who not only possess academic strengths and weaknesses, but who also have talents, interests, and life experiences that teachers can tap when planning lessons. In the AMI Study, more than one teacher changed her perceptions of her students by coming to know their talents and lives outside of the classroom. They then used that newfound information in their teaching.

Program Readiness. Over the course of the AMI Study, we learned that to engage in and sustain MI-based practices, teachers need the support of their literacy programs. Without program support, the teachers' efforts may go against rather than with the flow of the program. Without this basic support, implementing new teaching approaches can be difficult if not impossible.

Programs can express institutional support by ensuring that teachers have adequate paid preparation time and access to staff development, and permission to purchase a wide variety of supplies. Reports from the practitioner study circles that NCSALL sponsored in 2001, which used the AMI Sourcebook, *MI Grows Up* (Kallenbach & Viens, in press) as their text, consistently and emphatically identified lack of adequate time to learn, plan, reflect, and explore as a barrier to implementing MI-based practices. Another barrier that many practitioners identified was an open-entry, open-exit enrollment practice that disrupts the learning community and the continuity of instruction.

Teachers implementing MI-based practices often need support in changing the physical learning environment so that it is conducive to different types of activities and groupings, to physical activities, and to displays of student work on the walls. Literacy programs should to strive to provide teaching environments in which students and teachers have the materials and adequate space to express themselves

through different intelligences. Although MI-based efforts are not impossible in limited space and with limited resources, the theory's potential cannot be fully explored in such limiting settings.

Implementing MI at the program-wide level could involve institutionalized opportunities for students to engage in self-reflection. Through revised intake and assessment procedures, students and teachers would be encouraged to self-assess and discuss the students' intelligences. Supporting MI-inspired practices may also mean securing resources that enable students and teachers to take learning outside the classroom. Where these resources and accommodations do not already exist, literacy programs need to develop the will and perseverance to pursue them. This may require an organization to learn about MI-inspired teaching practices and their potential value; that, we hope, would lead to program decision-makers' commitment to support such practices.

Policy

The AMI Study was conducted in a range of settings typical of our field and in a context of prevailing state and federal policies that affect the provision of adult literacy services. Toward the end of the AMI Study, a new national policy came into effect: the National Reporting System (NRS). For states to receive federal funds for adult literacy, they must achieve and report outcomes according to a uniform set of criteria. Although each state may add additional outcomes and determine how these outcomes are measured using valid and reliable assessments, a state's federal funding is tied to the achievement of a set of core outcomes. These outcomes measure educational gains; placement in or retention of employment, training, or postsecondary education; and receipt of a GED or secondary school credential. There are also secondary outcomes, such as passing the citizenship exam, meeting a work-based learner goal, registering to vote, reading to one's children, and getting off welfare.

A recent study on outcomes of participation in ABE found that although adult learners reported outcomes that correspond to learning gains and other NRS-defined categories, they were more likely to name outcomes related to their sense of self and to changes in how they used literacy in their everyday lives (Bingman et al., 2000, p. 12). For example, participants in that study reported a "strong sense of accomplishment" and a stronger voice to express themselves in varied situations, reminiscent of the AMI Study. However, the NRS does not capture these outcomes, and as Bingman points out, "Adult educators tend to focus efforts on what is measured and reported, particularly if funding is tied to it" (p.14).

The NRS places a high premium on specific, predetermined outcomes. In most states, the learning gains are measured by standardized tests such as the Test of Adult Basic Education (TABE). These tests are very different from—if not antithetical to—performance assessments, and they do not capture the range of skills and knowledge students may gain from learning projects. If it is true that what is measured is what is valued, the NRS and the assessment it engenders at the state level may well discourage the kind of learning projects, experimentation, and unconventional teaching that many MI-inspired approaches entail. When the stakes are high, teachers may feel that trying new teaching approaches and materials is unwise and risky, especially if they also would have to move beyond their own comfort zone.

MI Reflections activities that develop metacognition and self-knowledge do not figure in the NRS accountability system. A relatively narrow range of high-stakes outcome goals engenders curricula packed with skills and content to be covered. These demands on limited instructional time bump up against the goal of developing students' metacognitive skills, such as reflecting on one's intelligence strengths and learning preferences. Although research has demonstrated the benefits of developing students' metacognition—their learning strategies and self-monitoring ability—it has not received much attention in the adult literacy field (Palincsar & Brown, 1984). This may be partly because the research has not been conducted with adult literacy learners, and teacher training in developing students' metacognitive skills is lacking.

A policy and accountability system that speaks to what we learned would capture a broader range of goals and more multidimensional ways to gauge student progress. For example, improvement in students' sense of self-efficacy or meta-cognitive skills could be legitimate secondary outcomes. To convince policymakers of the value of MI-based approaches, more definitive research is needed to investigate learning gains and other impacts of MI-based practices.

Research

As an exploratory qualitative study, the AMI Study sets the stage for further research in the area of MI theory in adult literacy education. Studies that look at the impact of specific MI-based interventions would be a logical outgrowth of the AMI Study. Our study generated MI-based practices that hold promise for improvements on several fronts. Individual teachers reported improvements in their students' attendance and engagement in learning activities. Meg Costanzo found a relationship between low scores on the personal intelligences—as assessed by the students themselves—and the students' persistence in their studies. Martha Jean documented improved

attendance and engagement for her LD students as a result of MI-based learning activities in which there was only limited attention to the personal intelligences or MI Reflections. Another potential impact that merits a more rigorous investigation is whether and how MI-inspired practices improve students' self-efficacy. The AMI Study yielded strong indications that there is a positive relationship between students' learning about and being assisted in using their intelligences and learning preferences to good effect and their improved perceptions of their abilities.

Another potentially fruitful area of study is teacher change. Although this was not the focus of the AMI Study, we documented changes in the AMI teachers' practices and dispositions. We attribute these changes to MI theory and how different teachers used it, based on their existing beliefs, practices, goals, and teaching contexts. However, we also acknowledge that the way in which the AMI study was designed and implemented—with a learning community of teacher research partners at its heart—also affected the teacher change process. This raises questions: Is the AMI Study design a useful model for other efforts that aim to introduce teachers to new theories or practices? What kinds of staff development and support structures are conducive to teacher change? How can MI-based practices theory prompt teacher change? In addition, it would be instructive to do a follow-up study with the teachers who were involved in the AMI Study to ascertain the extent to which they made lasting changes in their teaching practice as a result of their participation in the AMI Study.

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APPENDIX 1:
AMI STUDY ADVISORY COUNCIL

The advisors are listed according to their affiliations at the time of their involvement with the study.

Elsa Auerbach, Associate Professor
ESOL Graduate Studies, University of Massachusetts, Boston

Evelyn Beaulieu, Director
Center for Adult Learning and Literacy, University of Maine

Don Chao and Kathy Hanaway, Staff Development Specialists
Adult Training and Development Network, Capitol Regional Education Council, Connecticut

Janet Isserlis, Director
Rhode Island Literacy Resources, Brown University, Rhode Island

Martha Merson, Adult Basic Education/Literacy Specialist
Adult Literacy Resource Institute, Boston, Massachusetts

Andy Nash, EFF Staff Development Coordinator
New England Literacy Resource Center/World Education, Massachusetts

Dorothy Oliver, ABE/ GED Staff Development Specialist
New Hampshire Department of Education

Mary Jane Schmitt, Math Staff Development Specialist
Harvard Graduate School of Education

Alison Simmons, Staff Development Specialist
SABES/World Education, Massachusetts

APPENDIX 2:
ADULT MULTIPLE INTELLIGENCES (AMI)
PROJECT APPLICATION

Basic Information About You

Applicant Name

_____

Program Name

_____

Address

_____

Zip code_____Phone_____Fax_____
E-mail _____

Program type. Check all that apply:
__ ESOL __ ABE __ GED/EDP/ADP
__ community based __ school based (LEA) __ community college

__ other __ family literacy __ workplace/worker __ corrections __ library
__ volunteer

__ rural __ urban

Why are you interested in participating in the AMI Project? What do you want to get out of it?

Your Teaching

What is your current position?

This project requires that you teach one class at least four hours a week in order to be eligible to participate. Please describe your teaching load:

Class 1. Number of hours a week you teach it

_____ _____

Class 2. Number of hours a week you teach it

_____ _____

(Please continue on a separate sheet if necessary.)

Please give the dates of your class cycles for academic year 1996–1997:

Can you reasonably expect to be teaching in this program through spring 1998?
__ Yes __ No

When did you begin teaching in this field?

What are your basic beliefs about how adults learn? (Feel free to continue your answer on a separate sheet.)

How are these beliefs manifest in your teaching? Please give a few examples.

What aspects of your teaching or curriculum do you want to refine or work on?

Are there other things you would like us to know about your teaching approach?

It is not necessary that you have used the Multiple Intelligences (MI) framework, but if you have, please tell us how you have done so.

Teacher Inquiry

It is not necessary that you have an inquiry/research question at this point, but if you do already have a question(s) in mind that you might want to investigate related to the application of multiple intelligences in your instruction, please share your question with us. Or what subject area might your question be drawn from?

It is also not necessary that you have done teacher inquiry/research before, but if you have, please tell us about it. What was your inquiry question(s)?

How did you go about doing the inquiry?

Your Access to Computers

This project requires that you have access to a PC or Macintosh computer, and that you submit your documentation on disk. Do you have this access, or can you obtain it for the duration of the project, November 1996–July 1998? __ Yes __ No

This project also requires that you have access to the Internet and use the Internet regularly to communicate with the other teachers and project staff and advisors. This means that your computer needs to have a modem and communications software and that you need to get an Internet provider and access to a phone line. You can cover these costs from your AMI stipend if they are not covered otherwise. You will be responsible for finding any support you may need on how to use the Internet. Do you have access to the Internet, or can you obtain it for the duration of the project, November 1996–July 1998? __ Yes __ No

Have you used the Internet regularly before? __ Yes __ No

If you are new to the Internet, can you find someone who is willing to teach you how to use the Internet? __ Yes __ No

Is there anything else you would want us to know about you or your program?

Acknowledgments and Recommendations

I have read the information about this project and understand its scope and requirements. If selected to participate, I will make every effort to participate actively in the project and fulfill its requirements.

Your signature_____Date_____

Supervisor's Approval

Participation in the AMI project requires that the teacher attend one 3-day and one 2-day training and sharing institute in Year One (11/96–6/97), and two 2-day institutes in Year Two. In addition, it requires a substantial amount of planning and documentation by the teacher over and above her regular duties. The AMI project also involves classroom observations and videotaping of instruction by the project staff. Your full support and approval is necessary. Please sign below to indicate your approval of this teacher's application in the AMI project.

Supervisor's signature_____Date_____

Supervisor's name_____Title_____

Letter of Recommendation
Please attach a letter of recommendation from a colleague or supervisor.

Please return your completed application with your resume **by September 30, 1996** to:

Silja Kallenbach
NELRC/ World Education
44 Farnsworth Street, Boston, MA 02210-1211
Phone: 617-482-9485
Fax: 617-482-0617

APPENDIX 3: AMI TEACHER INTERVIEW AND OBSERVATION GUIDE
October 1997

Before the Observation
(phone conversation)

Is there anything in particular that you would like me to observe for you?

What are your goals and plans for this class?

How do these goals and plans relate to your research question?

What should I know about what has been going on before this class?

After the Observation

What stood out for you about today's session?

What can you extract from today's session for your research project? (lessons, questions, hypotheses, change in plans)

MI in Instruction and Assessment

How would you describe your use of MI in instruction and/or assessment at this point? (Be as detailed as possible and refer to today's session if applicable.)

MI and Teacher Change

Did you enter this phase of the project with any new insights about your teaching or yourself as a teacher?

What's new in your teaching this semester/cycle?

How does this compare with how you taught before?

The Teacher Research Process

What can you tell me about our research process this semester? How is it working? (problems, resolutions)

What does the data seem to tell you at this point in relation to your research question? What patterns do you see emerging?

What kind of support or technical assistance would you want from us?

AMI Student Interview Guide

The interviews will be conducted with the whole class, starting with the first site visit (with teacher and student permission).

1. Tell me about your favorite lesson so far in this class.

2. What about it did you like?

3. What lesson was particularly helpful in learning _____ [GED prep, English, math, etc.]

If applicable:

4. What have you learned about multiple intelligences (how people are smart in different ways; use teacher's vocabulary) in this class?

5. Do you see any relationship between this information and your own learning and life?

6. If yes, could you tell me how you relate it to your own learning and life?

Observation Guidelines

-Keep descriptions separate from interpretation

The observation description should note:

- verbatim quotes; selected verbatim transcriptions
- sequence and time intervals of activities
- number of male and female students
- length of the observed class
- details about the environment and the physical context
- body language of teacher and students
- observe/note what is not happening that you would naturally expect to happen

APPENDIX 4: ABSTRACTS OF THE AMI TEACHERS' RESEARCH REPORTS

The full report *Multiple intelligences in practice: Teacher research reports from the Adult Multiple Intelligences Study* (2001) is available from the National Center for the Study of Adult Learning and Literacy at http://ncsall.gse.harvard.edu.

BETSY CORNWELL

Will awareness of their own intelligence profiles help my students become more independent learners?

Abstract

Betsy Cornwell's research project is motivated by a desire to gain a better understanding of why some seemingly motivated and capable students appeared to be unable or unwilling to do the academic work necessary to reach their own goals. She sets out to assist her students in developing their intelligence profiles, expecting "the intelligence profiles to be a self-reflection tool that would help my students determine their most effective problem-solving techniques." She discovers that "what had appeared to be ineffective problem-solving techniques turned out to be a series of complex decisions and survival skills." Betsy finds herself compelled to examine her own assumptions and values related to teaching and learning. She comes to terms with the fact that, in many instances, they are different from those of her students. "Rather than forcing a student to choose between 'my way,' and 'your way,' I found that honoring my students' assumptions can be a starting point for expanding their understanding." This realization leads her to seek and create other tools besides intelligence profiles to help her students meet their basic needs for security and dignity while reaching their academic goals.

Relying on insights gained through student logs, her own journals, and observations from her one-to-one or small-group tutoring sessions, Betsy develops MI-based ways to counter student resistance. The report profiles five students as well as specific learning activities informed by MI theory that proved to be turning points in these students' learning process. Betsy concludes, "When my students feel threatened by an academic task, I can now look at the task through the lens of different intelligences and find optional ways to approach it. Often, just a change in materials can provide the way out that allows everyone to maintain their dignity and security."

MEG COSTANZO

How can teacher and students, working collaboratively, a) identify the student's strongest intelligences through MI-based assessment and classroom activities? b) use the understanding of these intelligences to guide the learning process?

Abstract

Meg Costanzo's primary research concern is how to identify her students' strongest intelligences through an MI assessment to guide their learning process. She begins her AMI journey by reflecting on her own intelligences and is then inspired to "encourage students to go through the same type of reflective process." In her small, rural program in which learners prepare to take the GED or work on a task-based diploma program, Meg develops an assessment students can use on their own. She then encourages her students to explore their intelligences in greater depth through weekly dialogue journals.

She discovers that "students appreciate having their intelligences acknowledged and valued. Many have never had the opportunity to claim their intelligences before this experience." Meg believes this deepened self-knowledge has served to increase her students' self-confidence, which, in turn, increases the students' willingness to experiment with nontraditional learning strategies. However, she also emphasizes the importance of providing repeated exposure to MI-based learning activities and strategies. Meg documents how she has infused her teaching with MI-based approaches, especially project-based learning. Several quotes from her students substantiate her finding that "adult students are enthusiastic about real-life projects and are willing to take a role in how their learning programs are designed." Meg concludes that working from their strengths leads students to think more readily "outside of the box" and to become better and more confident problem-solvers.

TERRI COUSTAN

What impact do ESOL activities informed by MI theory have on student engagement and learning strategies? How do prior cultural learning and experiences shape students' reaction to and participation in ESOL activities informed by MI theory?

Abstract

Terri Coustan's research efforts focus on how to use MI theory in her ESOL classroom in ways that enhance student engagement and learning. Most of her students are Hmong people from the hill country of Laos. Having worked with more or less the same group for the previous three years, Terri attributes her AMI findings to her implementation of an MI-informed approach, the one significant change in her classroom over the last year and a half.

Terri's approach is twofold. Through a synthesis of her informal observations of her students, she develops an understanding of their MI-related strengths and learning strategies. She then designs classroom activities geared to the strengths and strategies she has observed. She gives students a set of activity options in which to engage, in the content of the lesson.

Terri creates alternative "entry points" into the material that give students ways of learning and expressing their understanding beyond verbal means. She finds that the MI-informed choice activities aid students' academic progress, and she offers several cases in her report. Although Terri's students had difficulty understanding MI theory and were not able to identify their more specific learning strategies, they improved their ability to reflect on their own learning.

Interestingly, Terri found that giving students choices and setting a trusting context resulted in their taking greater control in the classroom and expanding their cultural norms for classroom behavior. Terri credits her AMI-inspired activities for fostering student participation and assertiveness, a stark contrast to three years of students' relative passivity.

BONNIE FORTINI

What kind of MI-informed instruction and assessment can be developed that will help adult learners deal with math anxiety so they may reach their stated goals?

Abstract

Bonnie Fortini's research centers on her students' math anxiety and possible ways MI-based applications could alleviate it. She uses a visual representation of math anxiety as well as a survey to help her students analyze and talk about their experiences. She also infuses her teaching with MI self-assessments and related discussions about MI theory. Her hypothesis is that knowledge about their own intelligence strengths will enable her students to develop better learning strategies, which, in turn, will combat math anxiety.

To a lesser extent, Bonnie designs MI-based lessons. In this she feels constrained by her students' traditional expectations of numbers and workbooks and limited talk in a math class. She also faces her own teaching preferences and intelligence strengths. Nevertheless, her few MI-based lessons draw positive comments from several students.

Bonnie finds that "the introduction of MI theory and the survey-generated illustration of our unique profiles of intelligences seemed to facilitate conversation among students about issues of education, even the more sensitive issues, like learning difficulties and math anxiety. Perhaps the opportunity to recognize that each person is a complex collection of strengths and weaknesses created a comfort level that allowed students to open up about problem areas." In the end, Bonnie concludes that "although students' discussions of MI, their own strengths, and math anxiety do not necessarily imply that MI helped alleviate math anxiety, they did provide the first step in that direction. MI showed itself to be an excellent point of departure for thinking about math anxiety and how students can work to overcome it."

MARTHA JEAN

Can MI-informed lessons help the progress and attendance of LD and ADD students preparing for the GED test?

Abstract

In her AMI research project, Martha Jean's challenge is to develop an approach that accounts for the rich diversity of intelligences and possible approaches represented in MI theory, while addressing the quite narrowly defined context of GED preparation. Martha has a particular interest in students who have been diagnosed or demonstrate ADD or LD characteristics. These students tend to have poor attendance and make little progress.

Martha addresses her research question by developing four types of MI-based experiences that respond to the different needs GED preparation engenders: (1) activities to introduce students to MI theory; (2) "warm up" activities; (3) topic-based whole-group activities; and (4) Choose 3 activities. Martha uses the introductory activities as a rationale for the practices in her classroom and to ensure that students understand they each have a unique profile of intelligences into which they can tap to prepare for the GED. "Warm up" activities are fun experiences, such as a "Koosh shoot," that help warm students to doing the more tedious tasks of GED preparation, such as workbook problems and practice tests. Whole-group activities are meant to teach specific skills or topics—for example, map reading—and help Martha gauge her students' understanding of those skills or topics.

The heart of Martha's approach is Choose 3 activities. Based on her own observations and student requests, Martha chooses a GED topic, such as measurement, or planets, or editorial cartoons, and develops about nine activities, from which students choose three to complete. The Choose 3 activities engage students in the material in ways that feel comfortable to them and are most likely to lead to understanding.

Martha's findings bear out the value of an MI-informed approach to GED preparation, particularly for ADD or LD students. The students' response to the MI-informed activities is overwhelmingly favorable. In fact, their attendance proves significantly better than that of the students in Martha's classes that are not informed by MI. Martha's data also demonstrates greater progress toward GED preparation for ADD or LD students in the MI-informed class.

Martha's findings strongly suggest the benefits of an MI-informed approach, but they must be tempered with the context's realities. Martha's fourth finding is that whether or how MI theory is applied depends on where students are in the GED preparation process. Namely, as students approach GED readiness, their studies need to narrow to specific GED content and discrete test-taking skills and away from the broad themes of Choose 3 activities.

JEAN MANTZARIS

How will adult diploma students' awareness of their own intelligences and participation in activities informed by MI theory affect their career decision-making process?

Abstract

Jean Mantzaris' research focuses on how students' awareness of and participation in MI activities will affect their career choices. Consequently, she infuses her career awareness class with MI-based activities and invites her students to explore their multiple intelligences. For example, in an effort to "dig deeply" into each students' intelligence profile, Jean asks the students to reflect on the activities they loved to do as children and to bring representations of these activities into class. She then invites students to consider a possible connection between their childhood preferences and the intelligences they had identified in the class as adults. Through this and other MI-based activities, students become more aware and appreciative of each other's strengths. Jean also observes a "notable increase in student engagement, motivation, camaraderie, and persistence."

Analysis of student comments and their plans for next career steps leads Jean to conclude that awareness of their own intelligences influences students to align their career decision-making with their intelligences. She notes, "Once students became aware of their strengths, possibilities of new careers abounded." This more complex understanding of their own strengths and corresponding career possibilities results in students extending their career exploration rather than identifying an immediate job choice. This proves to be a double-edged sword and, hence, a concern for Jean as students responding to welfare mandates are under pressure to take any job.

DIANE PAXTON

What effect does metacognitive awareness of their own multiple intelligences have on the perceptions of effective ESOL teaching and learning by students with limited native language literacy?

Abstract

Coming to the AMI Study with a well-developed and articulated theoretical background, Diane Paxton is challenged to consider how MI theory can inform her teaching in new ways, and in ways that do not interfere or contradict her already well-grounded practice as an ESOL instructor.

Like many others, Diane's students initially resisted MI-based approaches, seeing them as unusual, childish, or simply too different from the traditional approaches they knew and had come to expect. Interestingly, and perhaps because of her strong theoretical background, Diane herself resists MI. She finds the notion of assessing students' intelligences problematic, considering something as complex as students' profiles of intelligence too difficult, if not impossible, to assess. Once she recognizes that assessing MI is not prescribed by the theory—in fact, no specific practices are—Diane finds a comfortable place using MI theory as a framework to enhance further her multimodal approach to teaching English. In the process, students' perceptions change as well. They accept, engage in, and for the most part, become very enthusiastic about multiple and diverse ways of knowing.

Diane accounts for her students' changed perceptions in several ways. First, they become engaged and enjoy their participation in thematic units and projects that are informed, in part, by MI theory. Second, their reflections on their learning activities that Diane facilitated help them recognize and articulate how these new types of activities contribute to their improved English. Diane also notes that displaying project-generated work on the walls helps students recognize the role of this work in their learning English. Developing a trusting environment over time and forming a sense of community are also key to students' acceptance and ultimate enthusiasm for the nontraditional approaches in their classroom.

Diane also details some of the contextual factors that support or obstruct use of an MI-informed approach. These include students' prior educational experiences that shape their expectations; students' socioeconomic background and related invest-ment in the class; and institutional constraints, such as class size and setting.

Most significantly, Diane learned from the AMI project the importance of knowing one's own teaching context well and critically examining the theory or approach. In combination, these two elements are key to understanding if and how a particular theory or approach can support one's teaching and learning activities. Diane concludes that MI theory supports good ESOL teaching, and that it is a useful construct with a place in her teacher's "toolbox."

LEZLIE ROCKA

How does knowledge of MI theory broaden a multi-sensory approach to the teaching of writing? How does the application of MI theory enhance a multi-sensory approach to the teaching of reading?

Abstract

Lezlie Rocka's research project, on which her colleague Louise Cherubini collaborated during the first six months, is driven by a quest to understand whether MI theory has anything to offer to a multisensory approach to teaching reading and writing at the low-intermediate ABE level. Lezlie contrasts lessons she initially designed using a multisensory approach to lessons after she integrated MI theory into her thinking. She realizes that multisensory teaching uses the senses to impart information, but it does not entail choices for students to express their understanding. One outcome or change is the addition of choices to the reading comprehension component of her curriculum.

> We thought that if students were expressing and processing the information in as many ways as possible, this would assist them in using their strongest intelligences to understand the information. . . . We began to consistently create lessons that were more interactive and action-oriented. Students worked together, gave presentations, acted in skits, organized presentation charts, drew or sculpted scenes, etc. They seemed to comprehend the writing well enough that they could teach it to others.

The choice-based activities allowed Lezlie a much better view of her students' comprehension skills and strategies. She provides several examples from her classes that support her conclusion that "the application of MI theory in my reading lessons seemed to cause improvements in specific reading strategies, comprehension, retention, and interest in the reading." She notes that this progress was true for all but two of her students, whom she suspects have severe learning disabilities.

WENDY QUINONES

Will the use of a multiple intelligences framework support the goals and practices of popular education in an ABE classroom?

Abstract

As an instructor in a program that helps disadvantaged women identify and take steps toward personal and professional goals, Wendy Quinones had met with some success using the popular education approach in which the overarching goal is social action. For her project, she wondered whether MI theory might enhance her teaching.

Wendy considers the key aspects of popular education, such as developing self-respect and respect toward others, facilitating student empowerment, creating an environment based on democratic principles, and using nontraditional and "problem-posing" pedagogical approaches. She facilitates students' self-assessment and recognition of their own and their peers' intellectual strengths. She creates opportunities for student choice and decision-making in the classroom, and integrates more hands-on and real-world activities in her teaching.

Perhaps the highlight of her MI-informed activities is giving students opportunities to demonstrate their understanding of key concepts through MI-informed projects of their choosing. For example, students write and perform a skit about patriarchal mental health models; create three-dimensional artwork demonstrating images of women; and use timelines, graphs, and other graphic organizers to present historical information about women's lives.

Wendy's hunch that there is a natural fit between MI-informed approaches and popular education is validated in her study. She finds MI theory supports her efforts in ways that enhance her teaching methods and the classes' popular education-based goals and strategies. She identifies four related findings: 1) using a multiple intelligences-informed approach helps her align her teaching more closely to popular education principles; 2) using an MI-informed approach creates empowering opportunities for students; 3) an MI framework promotes a more democratic classroom environment; and 4) MI-informed practices serve to increase students' positive sense of self and appreciation of others, promoting respect and interdependence—key elements of popular education.

Through her efforts on the AMI Study, Wendy discovers that not only her students have been powerfully affected: "I feel that both my understanding and my practice have been transformed, and that, as a result, I am much closer to the kind of teacher I want to be than I was just 18 months ago."

NCSALL

National Center for the Study of Adult Learning and Literacy

NCSALL's Mission

The National Center for the Study of Adult Learning and Literacy (NCSALL) provides information used to improve practice in programs that offer adult basic education, English for speakers of other languages, and adult secondary education. In pursuit of this goal, NCSALL has undertaken research in four areas: learner motivation, classroom practice and the teaching/learning interaction, staff development, and assessment.

NCSALL conducts basic and applied research; builds partnerships between researchers and practitioners; disseminates research and best practices to practitioners, scholars, and policymakers; and works with the field of adult literacy education to develop a comprehensive research agenda.

NCSALL is a partnership of the Harvard Graduate School of Education, World Education, Rutgers University, Portland State University in Oregon, and the Center for Literacy Studies at the University of Tennessee in Knoxville. NCSALL receives funding from the U.S. Department of Education's Office of Educational Research and Improvement, National Institute for Postsecondary Education, Libraries, and Lifelong Learning; the Wallace-Reader's Digest Funds; the National Institute for Literacy; and the Office of Vocational and Adult Education.

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NCSALL's dissemination initiative focuses on ensuring that the research results reach practitioners, administrators, policymakers, and scholars of adult education through print, electronic, and face-to-face communication. NCSALL publishes research reports, occasional papers, research briefs, and teaching and training materials; the quarterly journal *Focus on Basics*; and *The Annual Review of Adult Learning and Literacy*, a scholarly review of major issues, current research, and best practices.

For more information about NCSALL, to download free copies of NCSALL publications, or to purchase bound copies, please visit:

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NCSALL

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